Learn the ABCs of mortise-and-tenon joinery

CUMULATIVE INDEX for issues 86 to 94

Better Homes and Gardens®

WOOD®

THE WORLD'S LEADING WOODWORKING MAGAZINE

JUNE 1997 ISSUE NO. 97

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See page 68

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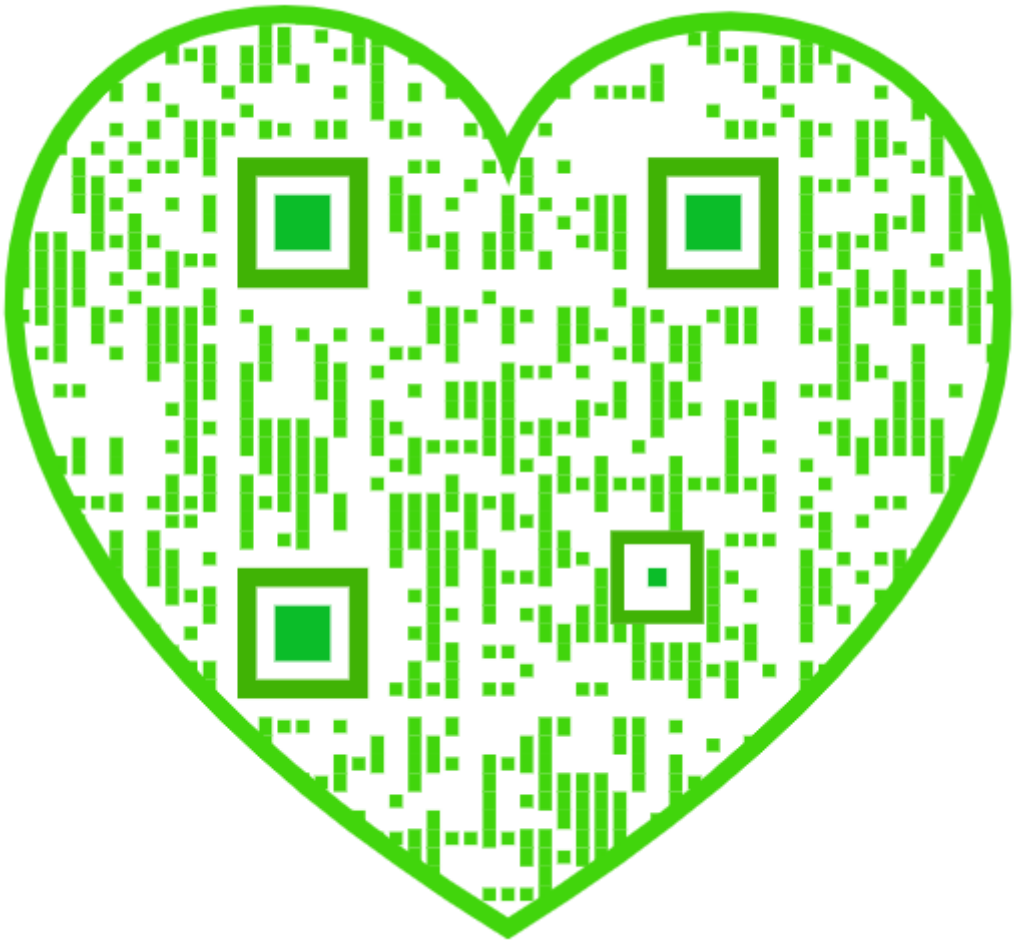

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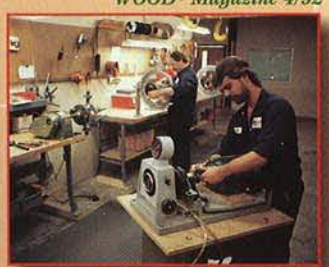

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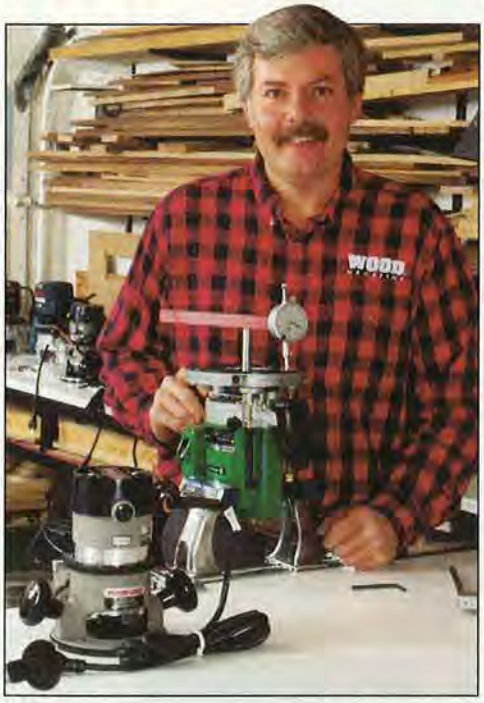
THE EDITOR'S ANGLE

He's One *Grrreat* Product Tester



Tool-testing expert Dave Henderson in his shop testing a group of routers for an upcoming issue of *WOOD*® magazine.

Ever since I met Dave Henderson several years ago here at the *WOOD*® magazine offices, I've had a lot of respect for him. He's resourceful, self-made, smart, knowledgeable, a good family man, and if that weren't enough, he's one of our two independent product testers. (You met our other tool expert, Bob McFarlin—The Dynamometer Man—in the August 1996 issue.)

I recently caught up with Dave at his workshop as he was testing some routers for an upcoming issue. And I thought you might be interested in learning a little bit about his tool-testing philosophy via our discussion.

Larry: Correct me if I'm wrong here, but you are not making a fortune testing tools for us.

Dave: That definitely would be an accurate statement.

Larry: So what's your motivation for doing this work?

Dave: Over time, I've spent a lot of money on tools that marketing people have done an excellent job of selling, but that in real life don't live up to the advertising.

Larry: What are you trying to accomplish for our readers as you do your testing?

Dave: I hope readers use the information Bob and I provide to buy the best tool for their money. I understand that most of our readers aren't rich and that they can't afford to waste money.

Larry: How do you view your relationship with woodworking-tool manufacturers?

Dave: I think that we've earned the respect of manufacturers by treating their products fairly, while being honest with our readers about the performance of those tools.

Larry: Do you ever get surprised during the course of your testing?

Dave: When I go into a test with preconceived notions about this or that tool, they invariably get blown out of the water.

Dave said quite a bit more during our chat, but I think you get the idea. He's serious about trying to get at the facts so you can make informed tool-buying decisions. Thanks for doing a great job, Dave!

To see yet another woodworking side of this interesting guy, please turn to *page 68*, and there you'll find Bill Krier's article chronicling Dave's exploits as a fearless backyard sawyer. It's fun, fascinating reading.

Larry Clayton

Print this article

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CONTENTS

Page 31

31 A pro at production
Discover how a California woodworker shaped a profitable business in architectural turnings.

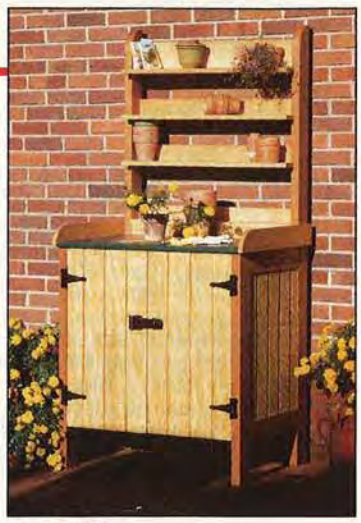
42 What a difference a day makes
Visit The Woodworkers' Place, a unique adult woodworking class in Pasadena, California.

50 How to edge-joint bowed stock
Try our techniques for salvaging bent boards.

62 Mortise-and-tenon joinery
Learn a simple and reliable approach for making the most time-honored joinery in woodworking.

68 Saw and save
See how one man cuts thousands of board feet from logs using an inexpensive chainsaw mill.

72 *WOOD* index
Add this handy 9-issue reference to your library.



Page 54

Page 42

Page 57

Woodworking projects in this issue

36 Planter/bench
Build and arrange the modular components here to create an exciting outdoor living area.

47 Avian acres
Treat the birds with our farmland feeder.

54 Potting center
Please a gardener with this handy workstation.

57 On-the-money tenoning jig
Cut tenons quickly and easily on your tablesaw with this precision workshop project.

76 Natural-born knocker
Put this woodpecker to work on your front door.

Page 62

Page 36

SHORT-SUBJECT FEATURES

1 The Editor's Angle
4 Talking Back
9 What Woodworkers Need To Know
14 Tips From Your Shop (And Ours)
20 Great Ideas For Your Shop
22 Tool Buyer's Update
24 Ask *WOOD*
78 Where Safety Begins
81 Wood Anecdote
102 Tool Industry Insider
104 Finishing Touches

This issue's cover wood grain: northern white cedar

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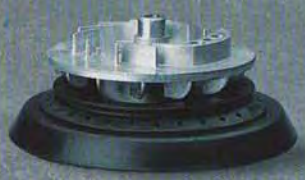

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TALKING BACK

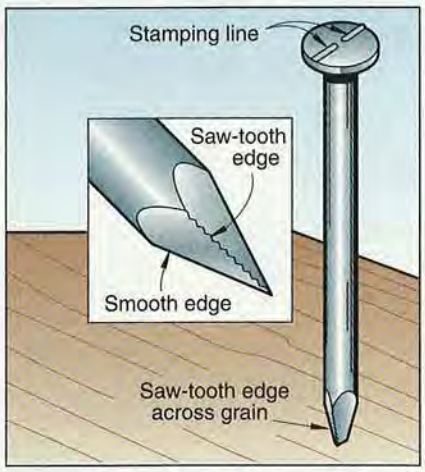
Another pointer for driving nails

I just finished reading your article "What Woodworkers Need to Know: A Few Points on Nails" in the January 1996 issue. However, your article didn't mention this basic method for driving a nail and not splitting the wood: You can position a nail so that it cuts the wood grain rather than separates it.

This technique works because all nails are made by stamping. This produces nails that have two rough and normally sharp edges and two opposite smooth edges on the point. When you position the rough, saw-tooth edges across the grain, the nail will act as a chisel and slice through the wood grain.

If you have difficulty telling the edges on the point apart, take a look at the nailhead. There you will see a stamping line. This line lies in the same plane as the sharp edges of the nail. As you set the nail to drive it into the wood, align this stamping line across the grain. It'll soon become a habit.

—Edgar Poulin, Sherbrooke, Quebec, Canada



More phone numbers

In our review of rip fences in the February 1997 issue, we did not mention two toll-free phone numbers. You can reach Voss Technologies, maker of the Pro-Rip and Evolution 1, at 800/386-5883. And, to reach the folks at RRR Safety Products, maker of the Vac-U-Fence, call 888/822-8336.

How to reach us

We welcome comments, criticisms, suggestions, and even compliments. We'll do our best to respond, perhaps even on this page! You can "talk back":

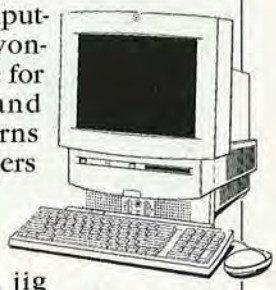
• ***Via mail.*** Send your letter to Talking Back, *WOOD*® magazine, 1912 Grand Ave., Des Moines, IA 50309-3379.

• ***Via computer.*** Send e-mail to: **74404.3516@compuserve.com** Compuserve members use: **74404,3516**

JET dust collector has steel impeller

In our review of dust collectors in the April 1997 issue, the chart on page 63 contained incorrect information. The JET DC650, which was selected as a Top Value among the 1-hp collectors, has a steel-plate impeller, not a plastic impeller as noted in the chart.

Templates for signs just a mouse-click away



The home computer will work wonders as a source for templates and alphabet patterns that woodworkers can use with the "You Can Be a Sign-Making Pro" jig shown in the November 1996 issue. I frequently use my drawing programs to produce a variety of number and alphabet patterns. I print out the letters to the required size, use spray adhesive to glue the paper template to a suitable board, and then scrollsaw the letters to shape. Only your imagination will limit the size and variety you can achieve.

—Theron J. Andrews, Aberdeen, Md.

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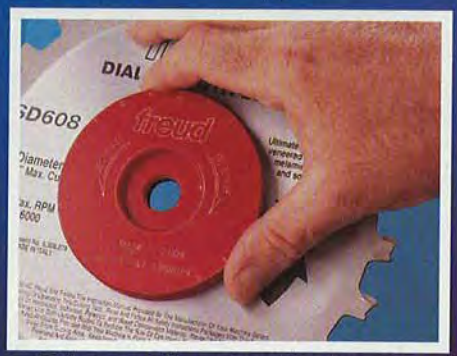

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What woodworkers need to know

Chisels

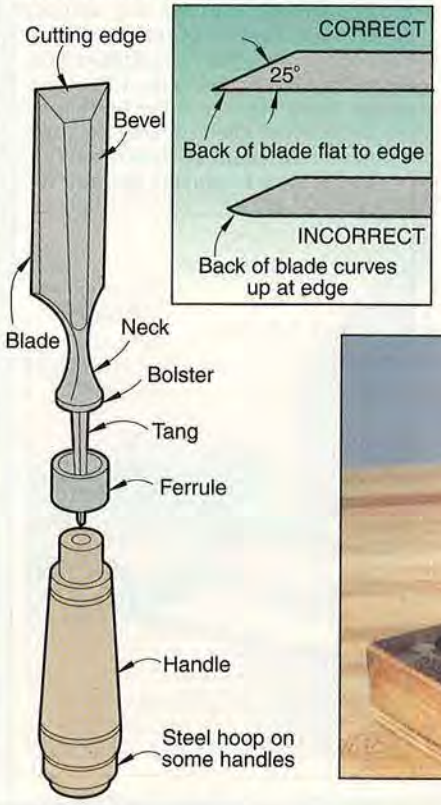
Still handy after all these years

Even though the chisel dates back to the dawn of woodworking, it can still do a lot of things for you today.

Simplicity in itself

Tools don't come much simpler than the chisel, as shown *below*. Though the drawing shows one with a wooden handle, many today feature plastic handles. Plastic handles absorb shock and resist deformation at the end when driven by a mallet, making them ideal for general shop use. (The chisels in the *WOOD*® magazine shop have plastic handles.)

If you buy a wooden-handled chisel and you'll be using a mallet on it, look for one with a leather washer between the bolster and the handle to help absorb shock. A steel hoop around the top of the handle minimizes mushrooming. (Stouter double-hooped handles feature one steel hoop at the top and another in place of the brass ferrule at the bottom.)



Names are not important

Over the centuries names by the hundreds have been heaped upon chisels. You'll hear references to the *firmer chisel* (an ordinary, general-purpose chisel with a blade 3–5" long), *butt chisel* (a shorter chisel), *framing chisel* (a wider, heavier one), *mortise chisel* (a longer version), *paring chisel* (one with a long, flexible blade), and more.

But when you're buying chisels, those names don't mean much. You'll do better to pick a chisel by looking at it and assessing how well it fits your needs than by relying on a name. A blade of high-carbon steel and a durable handle are the most important features.

Keep chisels sharp

Don't even try to use a dull chisel. Hollow grind the edge on a grinding wheel, maintaining the factory bevel angle. Then hone the blade on a flat oilstone or waterstone, using a sharpening jig such as the one shown *below*.

Be sure, too, to keep the back of the blade flat all the way to the cutting edge. If it curves up as shown in the illustration *below left*, the chisel may be hard to control and won't cut cleanly.

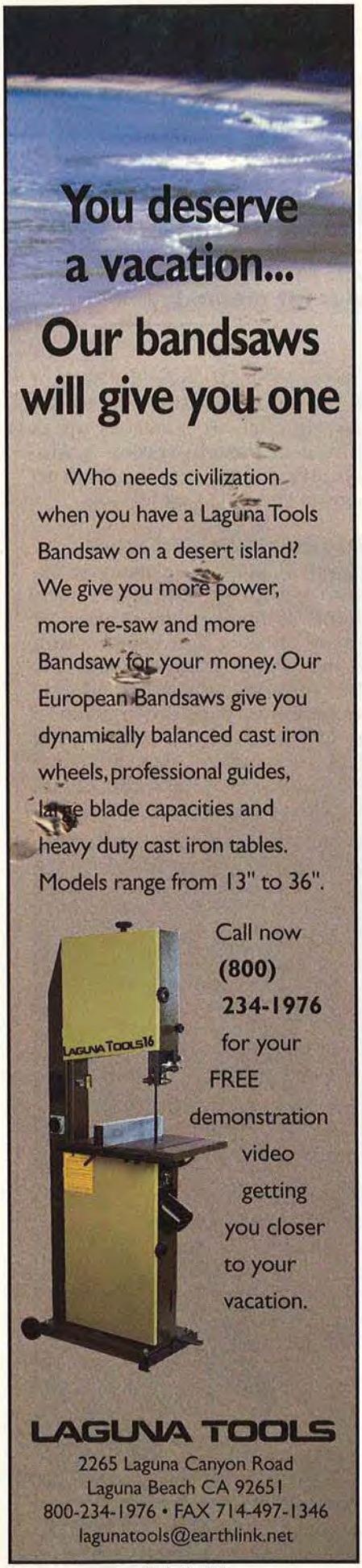
Putting chisels to work

Chisels handily meet many workshop situations. But, leave such things as opening paint cans or prying off door and window trim to the proper tool. You *can* use the chisel to clean off dried glue squeeze-out, pare down a tenon to fit a mortise, or trim a plug flush to a surface. Here are some other chores where the chisel comes in handy:

Cleaning a mortise

After drilling to remove most of the waste, go in with a chisel to finish a mortise. Work with the bevel up—that is, facing away from the mortise wall. For a through mortise, cut inward from both sides to prevent splintering the back.

Continued on page 10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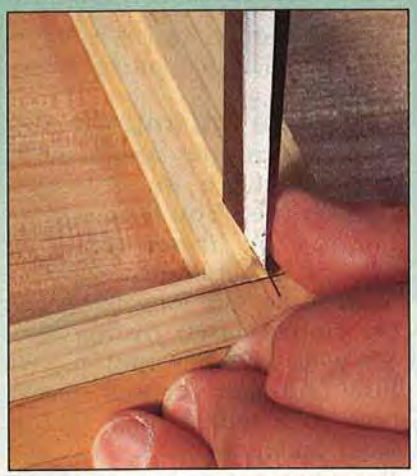
What woodworkers need to know

Chisels

Continued from page 9

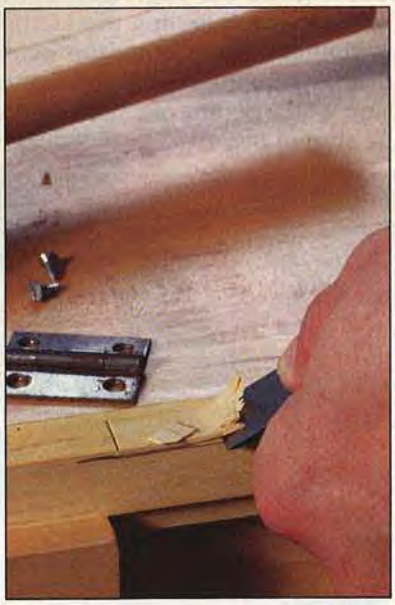
Squaring corners

The chisel shines for squaring up corners, as in this routed rabbet. First, hold the chisel vertically to make a cut extending each side to the corner (*left*). Then, remove the waste with a cut into the side of the rabbet (*right*). Toward the bottom of the rabbet, turn the chisel over and work with the bevel flat against the wood.



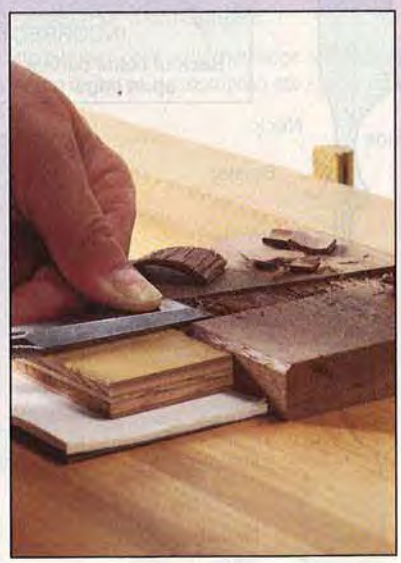
Inletting hardware

Set hinges and other hardware into shallow mortises so they'll sit flush with the surface. Trace the item's outline on the wood with a knife blade. Holding the chisel perpendicular to the surface with the back of the blade to the line, cut to the required depth. Then, clean out the shallow mortise with the chisel. Here you work with the bevel down.



Dadoing

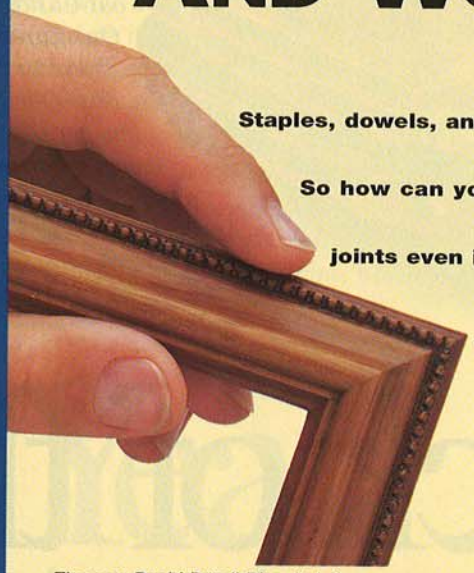
Cut the sides of the dado to depth with a backsaw or chisel. Then, clear out the waste with a chisel of appropriate width. A scrapwood gauge block, shown, guides the chisel straight into the end of the dado for a flat bottom. (You don't need it as you cut farther in.) To bring the top of the gauge block flush with the bottom of the dado, shim it with a 3×5" notepad opened to the required thickness. Cut from both ends to prevent tearout.



Photographs: John Hetherington Illustrations: Roxanne LeMoine

THE NEW RYOBI DETAIL BISCUIT JOINER

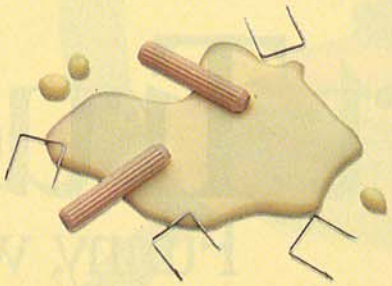
THE DIFFERENCE BETWEEN WOODWORKING AND WOODNOTWORKING.



Staples, dowels, and glue won't do. Standard-size biscuits won't fit.

So how can you make neat, tight, professional joints even in small stock? With Ryobi's new Detail Biscuit Joiner, that's how.

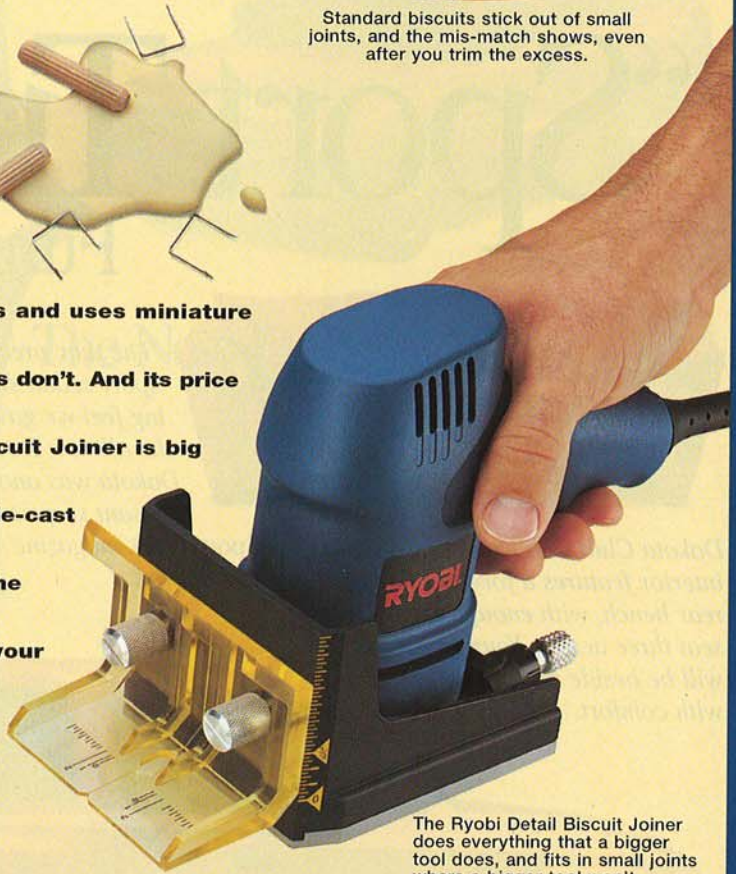
Standard biscuits stick out of small joints, and the mis-match shows, even after you trim the excess.



The new Ryobi Detail Biscuit Joiner uses miniature "Accu-biscuits" for neat, tight, professional joints.

This compact powerhouse cuts smaller slots and uses miniature "Accu-biscuits™" to fit where standard biscuits don't. And its price is as small as its biscuits. But the Detail Biscuit Joiner is big on performance, from its beefy motor to its die-cast base and see-through fence. So see the new Ryobi Detail Biscuit Joiner at your local home center. It'll get your wood working like never before.

Ryobi "Accu-biscuits" (actual size).



The Ryobi Detail Biscuit Joiner does everything that a bigger tool does, and fits in small joints where a bigger tool won't.

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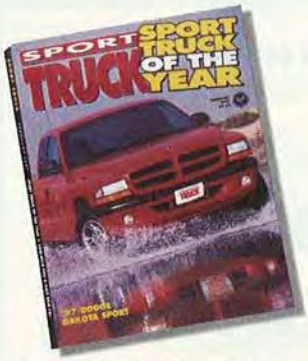
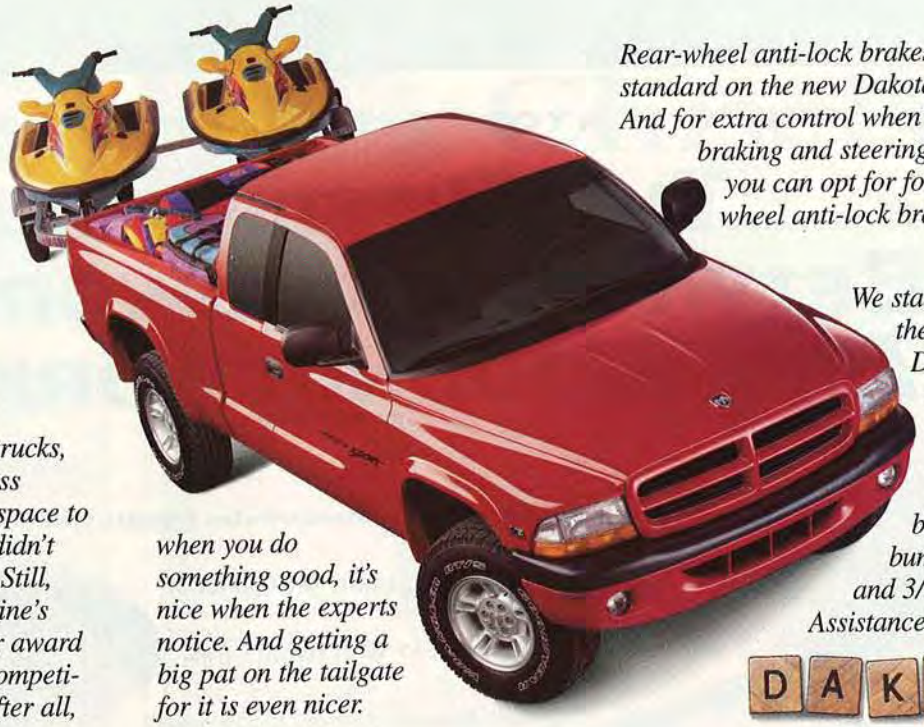


To those who know Dodge trucks, Dakota's slew of best-in-class designations, from interior space to available towing capacity, didn't exactly come as a surprise. Still, winning Sport Truck *magazine's 1997 Sport Truck of the Year award in the face of world-class competition, was very gratifying. After all, when you do something good, it's nice when the experts notice. And getting a big pat on the tailgate for it is even nicer.*



Rear-wheel anti-lock brakes are standard on the new Dakota. And for extra control when braking and steering, you can opt for four-wheel anti-lock brakes.

We stand behind the name Dakota, with our Customer One Care™ 3-year or 36,000-mile bumper-to-bumper warranty and 3/36 Roadside Assistance.†

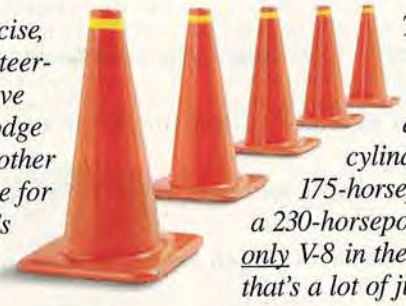
DAKOTA

"Sport Truck of th

Funny, we weren't surprised.

Dakota Club Cab's roomiest-in-class interior features a forward-facing rear bench, with enough hip room to seat three across. Your passengers will be beside themselves with comfort.

The taut, precise, sport-sedan steering feel we gave the all-new Dodge Dakota was another pleasant surprise for Sport Truck *magazine's test-drivers.*



The new Dodge Dakota offers a choice of Magnum® engines: a gutsy standard four cylinder, a powerful 175-horsepower V-6, or a 230-horsepower V-8—the only V-8 in the class. Now that's a lot of juice.

We code many of the new Dakota's plastic parts for the day they can be recycled. Because, like you, we think the world of the environment.

You can opt for a premium Infinity® stereo system with cassette and CD player in the new Dodge Dakota. Eight speakers in six locations kick out some real concert-quality sound.

Once again, Dodge opens new doors for Dakota owners. This time, with available remote keyless entry.

e Year."

We call it cargo. You call it stuff. Whatever you call it, there's more room for it in the all-new Dodge Dakota than in any other truck in its class.

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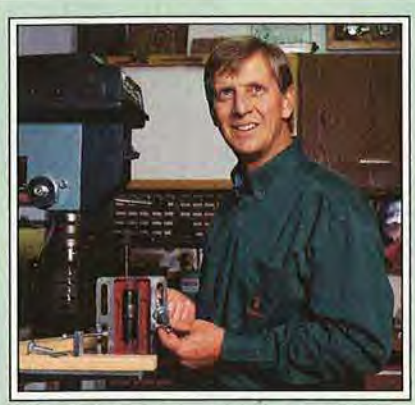
†See limited warranty & restrictions at dealer. Excludes normal maintenance & wear items.

Sport 4x2

The New Dodge Dakota
It's full of surprises.



Top Shop Tip winner Max Strain shows off his prizewinning idea.

Our Top Shop Tip winner for this issue spends his weekdays teaching science at Pioneer Trail Junior High School in Olathe, Kan. Outside the classroom, he devotes much of his extracurricular time and summers to woodworking.

Max Strain, 45, specializes in building wind chimes and folding deck chairs, and the need for drilling consistently spaced holes led to his winning tip. In the summertime, he runs a one-man deck-building service.

Your solution to a particular woodworking problem may be worth $40. If it's selected as the Top Shop Tip, you'll win a tool prize valued at $250 or more, and we'll include your photo in this column. To submit a tip, send a letter, including your daytime phone number, with a photo or drawing of your idea, to:

Tips from Your Shop
(And Ours)
***WOOD*® Magazine**
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We try to publish original shop tips, so please send your idea only to *WOOD* magazine. Also note that we cannot return submissions. Thanks!

Kerry Gibson

GENERAL-INTEREST EDITOR

Coupling nuts end drill-press fumbling

I make wind chimes for gifts, using copper or aluminum tubing suspended from an oak top. Before I can tie the tubes to the wood, I have to drill holes in them. And believe me, those holes have to be in exactly the right spot so everything lines up. That means I have to frequently reposition the vise on my drill-press table, which always had me fumbling around the thick table supports with a wrench. I finally decided, "There's got to be a better way."

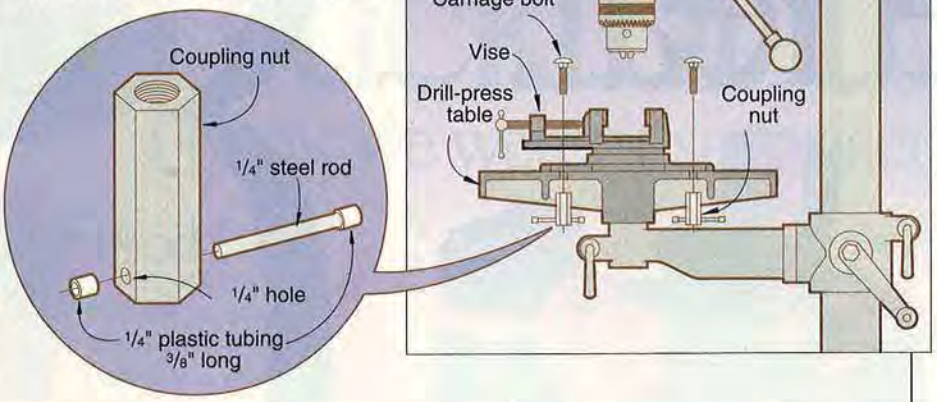
I bought two coupling nuts, 1½" long, to replace the nuts on the carriage bolts that hold the vise in place. Then I drilled ¼" holes through the coupling nuts near the bottom end and put a short rod through each one. Short pieces of plastic tubing pushed onto the ends of the rods keep them from sliding out.

The coupling nuts give me easier access for adjustments to the vise. And the rod provides greater torque for tightening and loosening.

—Max Strain, Olathe, Kan.

As our Top Shop Tip winner, Max receives a Makita 6233DWAE 14.4-volt, ⅜" cordless driver drill kit. Congratulations, Max.

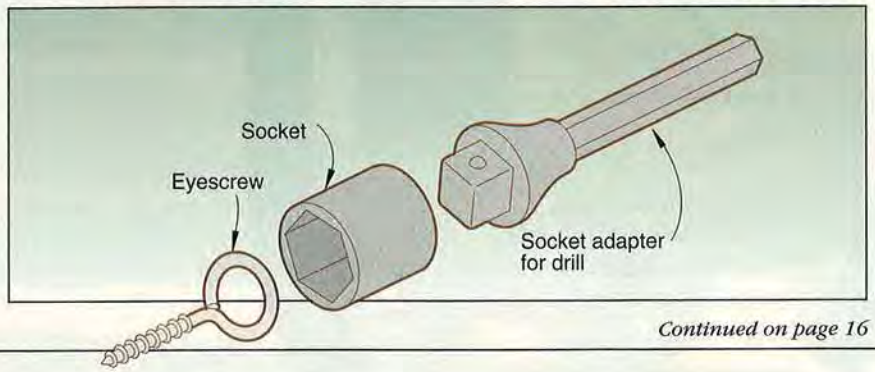
TOP SHOP TIP



Socket and drill quickly drive home eyescrews

One weekend I had to install more eyescrews than I wanted to do by hand. So I found a hex socket that fit snugly over the eyescrews, installed a socket adapter in my cordless drill, and got busy. It made short work of an otherwise tedious job and left me time for other projects.

—Ron Tye, Yorba Linda, Calif.



Continued on page 16

Print this article

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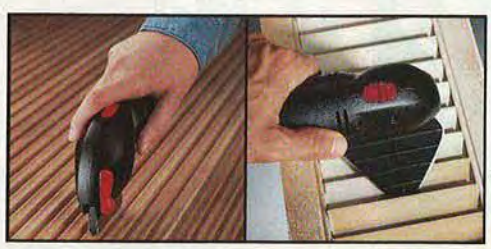
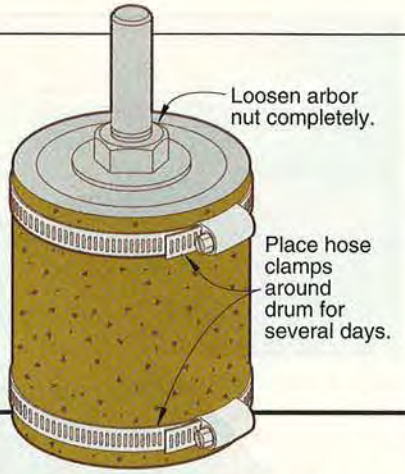


Continued from page 14

Clamps squeeze sanding drums down to size

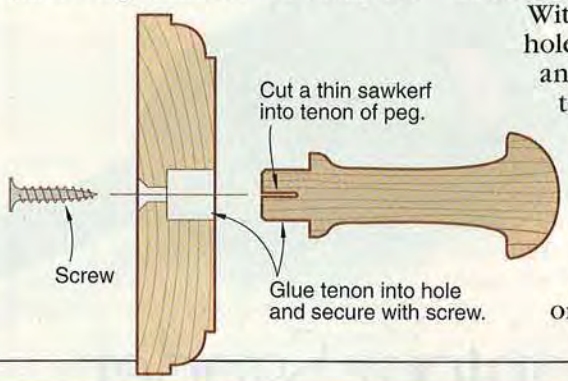
I learned the hard way that you should release the tension on a drum sander when you've finished using it. Otherwise, the rubber drum remains in its expanded shape and future sleeve changes prove difficult. Fortunately, I found an easy way to shrink the drum back to its proper size. I put hose clamps near each end of the drum, tighten them, and leave them in place for a couple of days. They squeeze the drum back into shape and let you slide the sleeve right off.

—J. David Patchett, Frankfort, Ind.



Screw keeps Shaker pegs from working loose

Installing a Shaker peg or dowel for a coatrack or similar project takes only a minute or two, but how can you make sure it stays put for years to come? Here's my solution to keep pegs in place.



With a Forstner bit, I drill a hole of the correct diameter and depth to receive the tenon of the peg. Then, I drill a ⅛" hole the rest of the way through the stock, using the dimple left by the Forstner bit as a guide. Next, I use a bandsaw or handsaw to cut a thin kerf centered on the tenon and extending about three-quarters of its length.

I glue the tenon in the hole, then insert a screw through the back of the stock and into the slot in the tenon. When you tighten that screw, the tenon expands slightly and fits the hole as snug as can be. I have never had a dowel or Shaker peg work loose, no matter how many coats I've hung on it.

—John A. Casto, Marlinton, W. Va.

Continued on page 18

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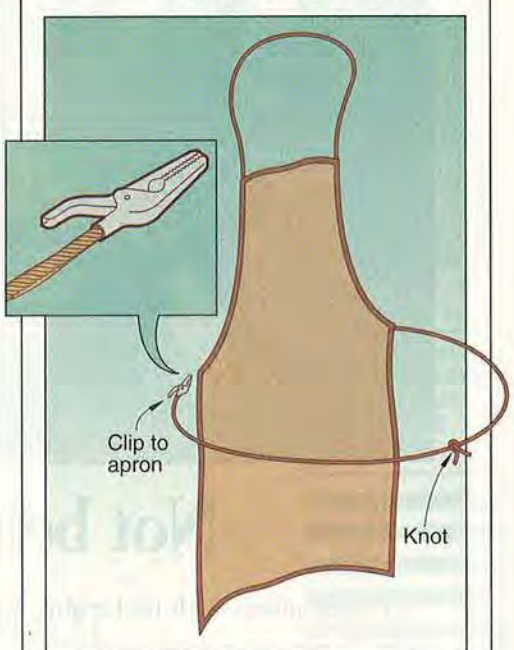
TIPS FROM YOUR SHOP (AND OURS)

Continued from page 16

Alligator clip's "bite" replaces apron ties

It's inconvenient to reach behind your back and tie the strings every time you put on your shop apron, especially if you suffer from arthritis. I simplified things by tying those strings one last time and then cutting one string where it attached to the apron. With an alligator clip fastened to that loose end, putting on the apron couldn't be easier.

—Ken Houcek, St. Charles, Ill.



A FEW MORE TIPS FROM OUR WOODWORKING PROS

- Want a jig fixture for a tablesaw miter-gauge slot that isn't affected by seasonal humidity changes? Find out what we used for just such a guide bar on our tenoning jig (*page 57*).
- Need to add or replace a cursor for hairline accuracy? See how we made the one on our tenoning jig on *page 60.*
- You can make small metal parts by following the procedures described under the "Make the metal feet" section of our woodpecker doorknocker on *page 76.*

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Circle No. 6

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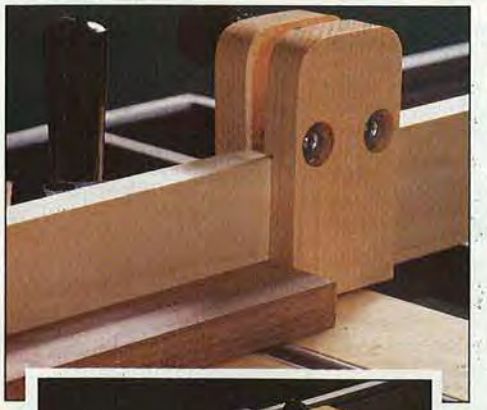

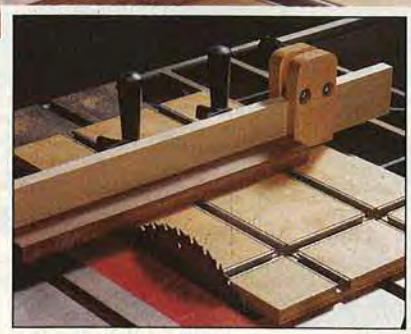

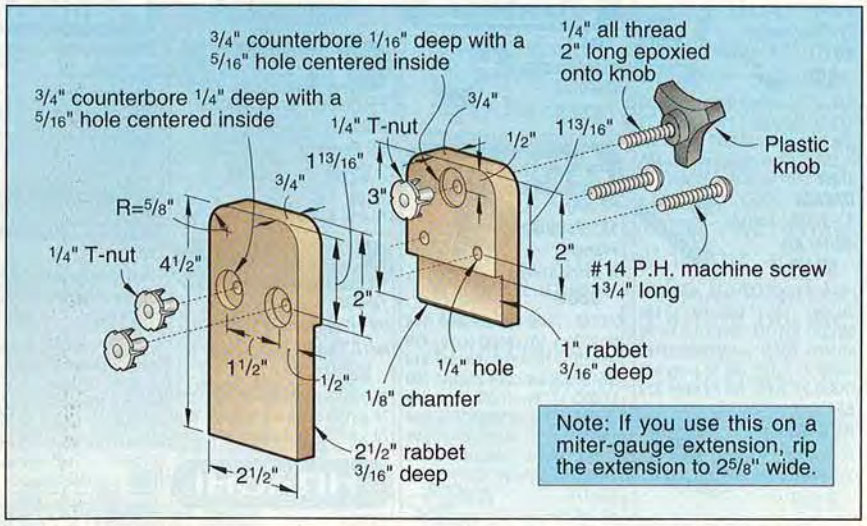

Use this handy stop on your own 2⅝"-wide miter-gauge extension, or add it to the sliding tablesaw jig shown *at left* and featured in the December 1996 issue of *WOOD®* magazine. It fits on the fence and allows you to cut piece after piece to the same length.

Project Design: James R. Downing Illustration: Roxanne LeMoine Photographs: John Hetherington

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Circle No. 1075

Several new kids on the gluing block

Lately, hardly a month goes by without a new woodworking glue entering the marketplace. While some are variations on a theme, others stand out for their breakthrough technology. To help you make sense of it all, I rounded up five recent entries (pictured at *right*) and put them through some real-world tests. Here's what I found.

Note: You may also want to check out the test results on pages 70-73 in the June 1995 issue of WOOD® *magazine. In that article, I looked at five new entries, including Elmer's Weather-Tite Wood Glue, Titebond II Wood Glue, RooClear, Gorilla Glue, and Excel Polyurethane Wood Glue.*

Titebond Wood Molding Glue

Applying ordinary yellow glues to finish trim, crown moldings, baseboards, and so forth has always been a messy business. So, I'm sure that professional and hobbyist woodworkers alike will appreciate this new glue's high wet tack—a glue's initial wet holding power—and quick set time.

I intentionally applied an excess amount of glue to check run resistance and was surprised at how much overload there can be before it actually runs. Surplus glue also didn't seem to affect the set up time, which at 65 degrees Fahrenheit was about 30 minutes.

Titebond Wood Molding Glue dries with a slight brownish tint, and it fills gaps that most other products won't. Unfortunately, you can't use it for outdoor projects or in high-moisture areas.

Titebond Polyurethane Glue

While Franklin has sold Titebond II as a *water-resistant* outdoor glue, it touts this new polyurethane as its first 100 percent *waterproof* glue for the home woodworker. I found the company's no-drip claim accurate—the glue almost refused to run. The cure time was approximately 2 hours at 65 degrees and 70 percent humidity, and the squeeze-out proved easy to sand and scrape without loading.

If you need a poly product for overhead work or in areas where drips or runs would be disastrous, try this product. But be sure you use the glue sparingly because it foams more than twice as much as the polys we tested earlier.

PL Premium Wood Glue

Several things impressed me about PL Premium Wood Glue. For starters, unlike some other polyurethane glues, it resisted running and dripping. Not only that, but this 100 percent waterproof product exhibits good initial tack, and low foaming compared to some other polys.

I did notice a tendency for it to stay more pliable for a long time, and in fact, it never did get as hard as others. This could be an advantage in situations where there will be a lot of movement.

I also like the fact that this glue comes in 4-oz. containers as well as 8-, 16-, and 32-oz. sizes. Since you use polyurethane glues sparingly and they have a limited shelf life—typically a year—the glue in larger bottles often goes to waste.

Elmer's ProBond Ultra Polyurethane Glue and ProBond Wood Glue

As the name implies, Elmer's touts both of these products as part of the company's first industrial-strength line of wood glues. I'm glad that attention has been turned to the professional market.

In my test of the polyurethane glue, I judged it comparable to the other polys I've tested. It exhibited about the same degree of foaming, and was roughly equivalent in strength as well.

After using the ProBond Wood Glue in my shop, I rank it even with other yellow glues in wet tack and final strength. I especially like the container's offset triangular-shaped spout, which easily reaches into corners and tight spots. You're less likely to lose the large, orange cap, and the bottle's wide-mouth, screw-on top makes it a cinch to refill without spills.

—Tested by Dave Henderson

PRODUCT SCORECARD

Titebond Wood Molding Glue	
Performance	★ ★ ★ ★ ★
Price	About $3.15 for 8 oz.
Value	★ ★ ★ ★ ★
Titebond Polyurethane Glue	
Performance	★ ★ ★ ★ ☆
Price	About $6.25 for 8 oz.
Value	★ ★ ★ ★ ★
Franklin International, 2020 Bruck Street, Columbus, OH 43207. Call 800/669-4583.	
PL Premium Wood Glue	
Performance	★ ★ ★ ★ ★
Price	About $4.49 for 4 oz.
Value	★ ★ ★ ★ ☆
ChemRex, 889 Valley Park Dr., Shakopee, MN 55379. Call 800/433-9517.	
Elmer's ProBond Ultra Polyurethane Glue	
Performance	★ ★ ★ ★ ☆
Price	$9.99 for 8 oz.
Value	★ ★ ★ ★ ☆
Elmer's ProBond Wood Glue	
Performance	★ ★ ★ ★ ☆
Price	About $4.50 for 12 oz.
Value	★ ★ ★ ★ ☆
Elmer's Products, 180 East Broad St., Columbus, OH 43215-3799. Call 800/848-9400.	

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Check out this new detachable blower vac with 6 peak horsepower at your Sears store, or for convenience, call the "Sears Shop at Home" service, 1-800-377-7414.

Another reason to make some clamping cauls

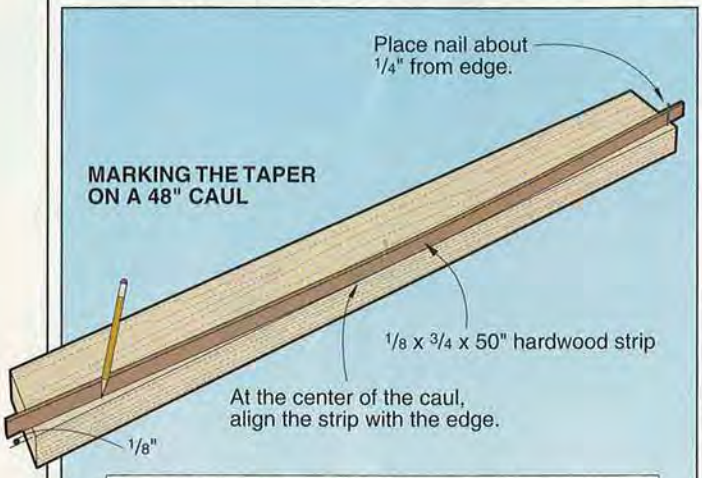
I want to laminate two layers of MDF (medium density fiberboard) to make a router-table top. Then, I'll cover both sides with plastic laminate. What type of glue works best with MDF, and how should I clamp the two pieces to obtain an even lamination?

—Dan Guisinger, dang547649@aol.com

Dan, any polyvinyl (white) or aliphatic resin (yellow) glue will work with MDF. Begin by applying an even coat of glue to the surface of one piece of MDF. Use a scrap of wood or a plastic spatula to even out the glue layer. Next, place the second piece of MDF in place and align the edges of the two pieces.

Apply weight or pressure evenly to hold the two layers together. In the *WOOD* magazine shop, we usually use clamps and clamping cauls to do this. As shown in the illustration at *right*, a clamping caul is a board with one slightly tapered edge that, as you tighten, applies pressure to the middle first, and then to the outer edges. Make your clamping cauls by following the instructions in the illustration shown *below*.

Distribute the pairs of clamping cauls about every foot along the MDF pieces as shown in the illustration *below*. Remember, do not apply excessive pressure to the clamps—doing so can create glue-starved areas in the lamination.


Place nail about 1/4" from edge.
MARKING THE TAPER ON A 48" CAUL
1/8 x 3/4 x 50" hardwood strip
At the center of the caul, align the strip with the edge.
1/8"

STEP 1. Rip a 48" straight 2x4 down to 2½" wide.

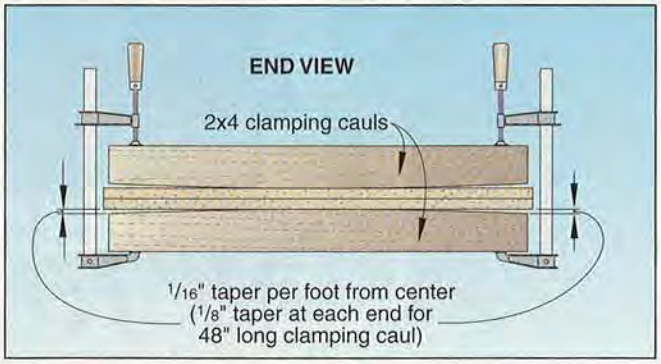
STEP 2. Place a nail in the center far enough back so the strip will align with the edge of the caul.

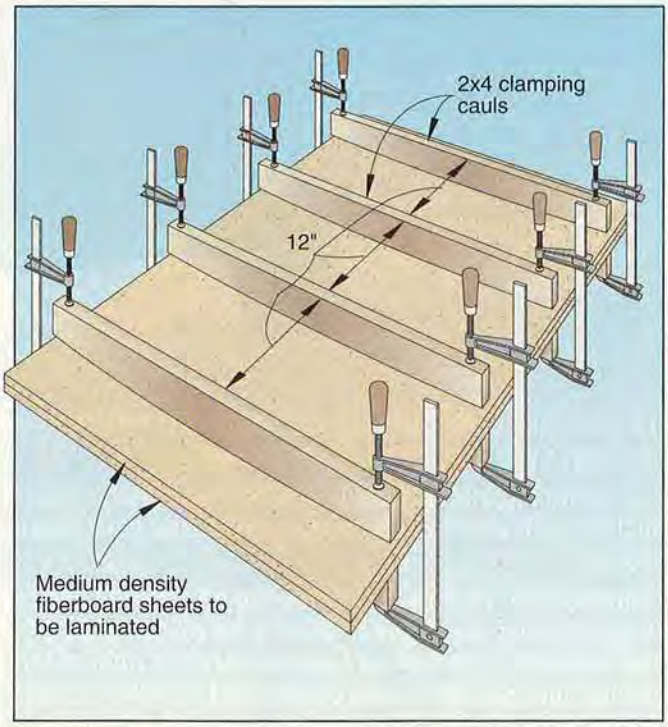
STEP 3. Place a nail in one end, ¼" from the edge.

STEP 4. At the opposite end, make a mark ⅛" from the edge and place the strip between the nails.

STEP 5. Hold the free end of the strip on the ⅛" mark, then mark the taper from the center nail to the end of the caul.

STEP 6. Repeat steps 3-5 to mark the other half. Then shape the taper using an edge sander or plane.





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Continued on page 26

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ASK WOOD

Continued from page 24

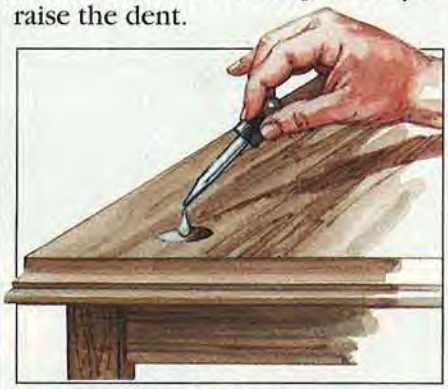
Steaming out a dent

I have an antique table that just sustained a dent from a falling plate. Can you suggest a way to correct this problem?

—Lawrence F. Rawie, Everett, Wash.

You can raise the dent in the table by applying hot water or steam to the compressed wood fibers. This causes the fibers to swell, bringing the surface of the dent closer to level with the tabletop.

To do this on finished wood, we suggest you apply a drop of boiling water to the dent with an eyedropper, and allow it to seep into the compressed fibers. Careful application of the water will limit the area in need of refinishing after you raise the dent.

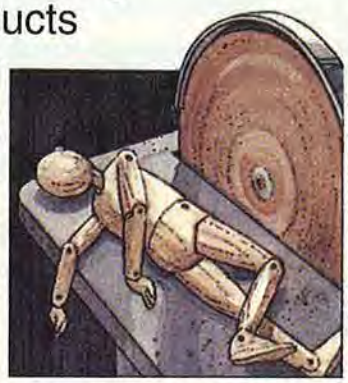


On bare wood, place a dampened cloth right over the dent. Then position the tip of a heated iron on the cloth. You'll hear a sizzling sound as the steam is forced into the wood. Remove the iron and cloth, and allow the wood to sit for a few minutes. If the marred area is still depressed, repeat the steaming process as needed.

A word of warning: do not sand around a dent before attempting to raise it. Otherwise the compressed fibers in the dented area will expand more than the surrounding surface fibers. This leaves the formerly dented area raised above the table surface.

A third approach to dealing with the dent in the table is to leave it alone. This will add to the character of the table. Just imagine one of your descendants saying "There's the dent great-great-grandfather put in the table back in 1995."

Wanted: longer-lasting sandpaper products



I use thin strips of imbuia (Brazilian walnut) for making the puppets I build. However, when I round over the ends to make the puppets' joints, my sanding disc quickly fills with dust and resins, ruining the disc and burning the edges of the wood. And, my rubber disc cleaner seems to have little effect. What can I do to reduce this problem?

—David Powell, Kensington, P.E.I., Canada

Dave, sandpaper "loading" takes place when the dust particles become trapped between the abrasive and the workpiece. Loading also occurs when glues, finishes, or resins in the wood bond with the sandpaper's surface. This bonding occurs because of the heat generated through friction. Unfortunately, this kind of loading can be a serious problem when using power sanders. Although rubber cleaners help clean belts and discs loaded with dust, they don't do much good when glues, finishes, or resins create the loading. We suggest you do three things.

First, try using variable-speed sanders. By slowing the speed, especially when sanding end-grain, you will generate less heat, and this will reduce the problem of resinous loading and burning. Second, keep things moving, either the sander or the workpiece, and use the full width of the disc or belt to avoid building up heat in a single spot.

Third, use open-coated or stearated abrasive materials. Open-coated papers work well when the loading occurs because of dust. Chris Minick, a 3M lab technician, explains the difference between closed-coated and open-coated papers: "Close-coated papers have a surface that's completely covered with mineral grains. But, open-coated papers only have 40 to 70% coverage, leaving free space that allows dust to escape."

Stearated abrasives have a coating similar to soap (appearing as a whitish or gray film on the paper) that also reduces clogging, especially when working with recycled or resinous woods. However, stearates are not always compatible with water-based finishes. So, be sure to clean the work surface with a rag dampened with mineral spirits before finishing. Stearated papers come under different labels such as 3M's Fre-Cut, Norton's No-Fill, and Klingspor's PS33.

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CHICAGO Electric Power Tools

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Now you can tackle those jobs that were too fine or exacting for a standard router. This compact router weighs only 4 lbs. for easy operation. Includes a straight and adjusting conductor to assist in trimming and engraving in both straight and circular patterns.

- 1/4" collet
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- 110V, 3-1/4 maximum amp draw
- 8-1/2" overall length
- 4 lbs. tool weight

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10", 2 HP, BENCH TABLE SAW

Die cast aluminum table 25-3/4" x 16", has adjustable 17-7/8" x 2" rip fence and inch/metric scale for precise cutting.

- Maximum depth of cut at 90°: 3-1/8"; at 45°: 2-1/2"
- Blade capacity: 10" with 5/8" arbor
- Miter gauge adjusts 0° - 60° left and right
- Motor: 2 HP, 115V, 60 Hz, 10 amp, 4500 RPM • Blade sold separately, below
- Shipping weight: 36 lbs.

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10" 40 TOOTH CARBIDE TIP SAW BLADE

- 5/8" arbor

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- 1/4" shanks

Includes: 1-1/4" rabbeting*, 1-3/8" cove*, 1-1/16" roman ogee*, 1-1/4" rounding over*, 1/2" flush trimming*, 1-3/16" 45° chamfer*, 1/2" dovetail, 3/4" straight, 1/2" straight, 3/8" V-groove, 1/4" combination panel, 1/4" straight, 1/2" mortising, 1/4" self-piloting flush trim, 3/16" self-piloting 7° bevel trim *Includes pilot bearing

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7-1/4" CIRCULAR SAW

- 115V, 10 amps, 60 Hz, single phase
- 5500 RPM • Tool weight: 8-3/4 lbs.
- Maximum cutting depth: 2-1/4"

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8-1/2" SLIDE COMPOUND MITER SAW

Hitachi C 8FB
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Hitachi D 10DF2
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Hitachi G 10SD1S
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DEWALT

DeWalt DW705

12" HEAVY DUTY COMPOUND MITER SAW

- 13 amps; 4000 RPM no load speed
- Spindle lock • Electric brake
- Stainless steel miter scale with 9 positive stops • 40 lbs. ship. wt.
- Includes 32 tooth blade
- 0-48° bevel capacity • 1" round arbor
- 0-48° miter left and right
- Capacities 5-1/4" crown moulding; 2 x 8 at 45° bevel; 4 x 4 & 2 x 6 at 45° miter
- Head lock down with handle for easy transport • 38 lbs. tool weight
- 100% ball bearing construction
- Factory reconditioned, factory perfect

LIMITED QUANTITIES

ITEM 51594-4VAA **$299.99**

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NEW!

TRIANGLE DETAIL SANDER

Use 3-3/4" triangle pads to reach into corners conventional sanders can't.

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- 10,000 OPM
- Hook and loop sandpaper holder
- Includes dust collection bag
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5 PC. TRIANGLE SANDING PAD ASSORTMENT

- 40, 80, 120, 200, and 240 grits

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14" GAS POWERED CHAIN SAW

- 32cc engine handles tough jobs
- Hard chrome cylinder bore for longer engine life
- Gear driven automatic chain oiler
- 3 position choke for easier starting
- Safety trigger prevents accidental acceleration • 15 lbs. ship. wt.
- Spark arrestor screen reduces fire hazard
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- 120V, 13 amps

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These titanium nitride coated high speed steel bits last up to six times longer than standard bits. Cool turning titanium bits are a must for metal workers. All bits can be resharpened. Straight shanks.

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- Same sizes as above
- M-2 high speed steel

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- 3/8" cutting edge

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- Includes free 8-1/4" multi-purpose blade

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1/3 HP

5 SPEED BENCH DRILL PRESS

- 620 to 3100 RPM
- 8-1/4" maximum distance spindle to table • 1/2" chuck
- 2" stroke, 8-1/4" swing
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- 1/3 HP motor

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FREE ACCESSORIES: Stand, 6" belt, 9" disc, open-end wrench, and hex key wrench

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COMBINATION 6" BELT AND 9" DISC SANDER

1 HP, 110V, 8 amps, 3450 RPM, all ball bearing motor; Overall height: 40"; Table tilt 0° to 50°; Table surface: 6-1/2" x 12-3/4"; Two position work table for disc or belt use; Disc speed: 1720 RPM; Belt: 6" W x 48" L; Belt speed: 1280 FPM; Weight: 121 lbs.

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- Front base has a V-groove to help guide in chamfering • 2 blade cutter
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- Includes rabbeting guide plate/fence, sharpening holder, blade setting jig, replacement brushes, replacement belt
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- 34,000 cuts per minute
- Tool wt.: 6-1/4 lbs.

SAVE 24% FROM OUR FALL '96 BOOK

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~~$9.99~~ **$7.99**

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- Factory reconditioned factory perfect

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MORTISING MACHINE

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These super short stubbys get into areas so small stubbys can't even fit! Perfect for appliances, stereos, television, and more. Features an easy grip handle and chrome vanadium bit. 1-5/16" overall length.

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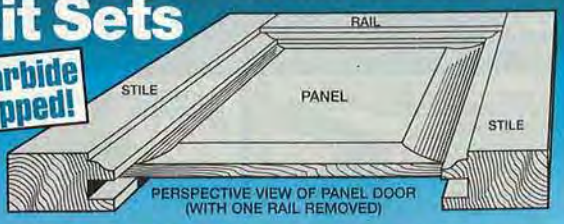

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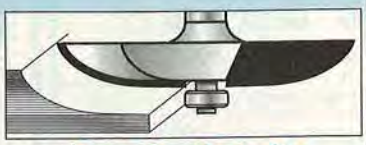
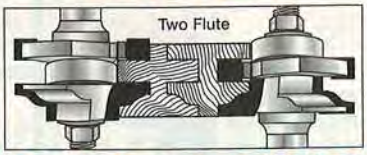


✶Raised Panel Router Bit



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Works with stock from 11/16" to 7/8".

Includes instructions & professional tips!

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SET#	BIT STYLE	RAISED PANEL LRG. DIA.	SET PRICE
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#1303	1/2" & 3/4" Shaper	4-5/8"	$99.95

✶Ball bearing included

QUANTITY DISCOUNT When ordering 3 or more router bits deduct $1.00 each!

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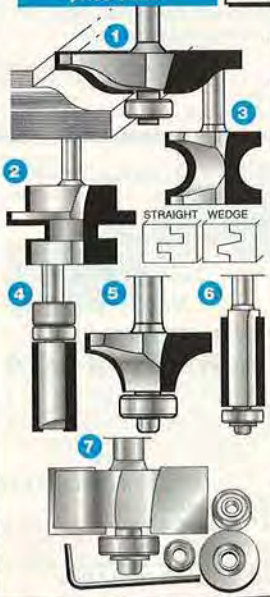

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7 RABBETING KIT
Change ball bearing guides and select 4 depth of cuts: 3/8", 7/16", 5/16", 1/4". Set: 1/4" shank rabbeting bit, 4 bearings (3/8", 1/2", 5/8", 3/4") and hex key.
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Drill accurate holes in wood, plastics & composites.

Bit sizes from 1/8" to 1/2" by 1/64" increments. Bits are deep fluted to clear chips quickly.

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A PRO AT PRODUCTION

California woodworker Gail Redman makes her living at the lathe, turning anything that fits between centers

She stands seemingly transfixed to the big lathe, her right hand gripping the gouge, her left guiding its cutting edge along the cedar 6×6. There's little noise except for the steady hum of the machine and the shearing by the tool's sharpened tip as it removes wood.

Suddenly, the nerve-jangling sound of the shop's doorbell interrupts. In response, Gail Redman puts down her turning tool and steps toward the entryway that leads to the street. "Good morning," says the perky 51-year-old after unlocking the still-chained door and peering out. Precautions such as this are necessary in the somewhat seamy side of San Francisco's Misson district.

"Mornin', Gail," says the brawny man in jeans and crisp work shirt. Under his arm he cradles a wooden staircase baluster antiqued by time and weather. "Want to see how much it'll cost me to have you turn a dozen of these," he says, explaining his presence.

On a regular weekday, the occurrence above may be repeated two or three times in the shop of architectural woodturner Gail Redman. But a busy weekday includes a dozen such interruptions. "The drawback to this business is the 'I-want-it-yesterday' demands of most contractors," says Gail after her customer departs with his quote. "They

Continued

At her English lathe, Gail begins roughing out a cedar baluster. For 6×6 and larger stock, she uses a 1½" gouge.

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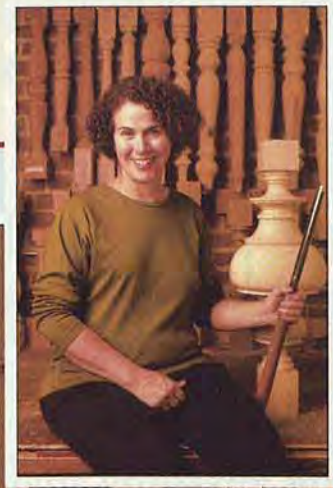
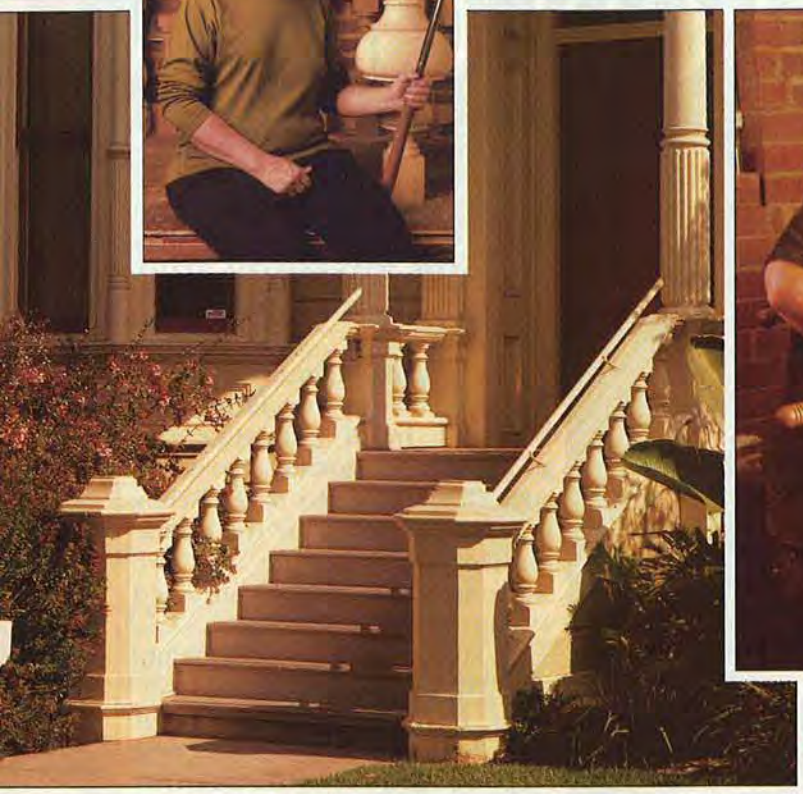
A PRO AT PRODUCTION



Left inset: The Victorian baluster next to Gail Redman represents the type of work that has kept her in business as a professional woodturner.



Above: The historic Higgins House in Oakland, California's Preservation Park features period balusters turned by Gail.

Above: After an elapsed time of 15 minutes since mounting the woo lathe, Gail puts the finishing touches on the cedar baluster.

never seem to have their act together, so I'm constantly under pressure to get turnings out. Yet I do love my work, and so far I've never gotten bored with it."

Although she now modestly claims the title of the nation's only female architectural woodturner ("At least I've not heard of another who does production work"), Gail began her woodworking career in the shop of an evening adult education class in the late 1960s. "I was teaching at the elementary level in some of the San Francisco Bay Area's toughest districts," she recalls. "To reduce stress, I took woodworking, and discovered woodturning." Yet for Gail, it was years and thousands of adventurous, globe-trotting miles later before she would permanently settle into a stance at the lathe.

The journey to down under

Refreshed by evenings in the high school woodworking shop, Gail managed to continue teaching for a few more years, balancing it with travel to Africa and southern Asia. Finally, she felt she was ready for a move.

"I had continued to learn how to turn plates and bowls—the usual stuff," Gail explains. "Then, a furnituremaker friend pushed me into pursuing it. And an old friend who had immigrated to New Zealand encouraged me to come down for a look. He claimed that there was a lot of woodturning going on down there. So I packed up and headed for New Zealand. Only I took the long way around."

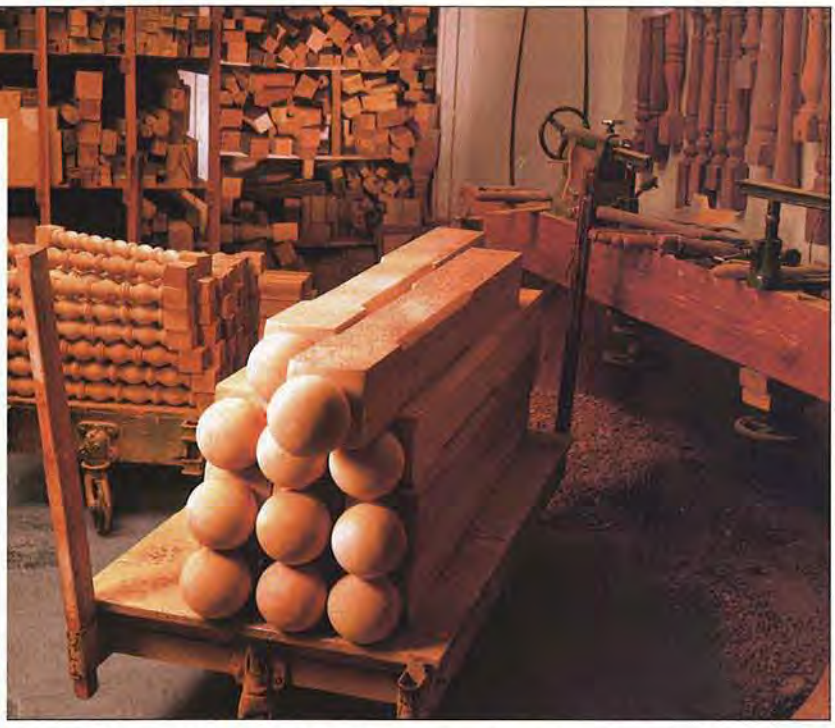
In a nine-month period, Gail visited Japan, all of Southeast Asia, and Indonesia. Finally arriving in Auckland, New Zealand, she began seeking a woodworking job. "Auckland was like the commercial woodturning capital of the world," she comments. "It was unbelievable to see so much handwork there, even in 1974."

What Gail found was a turning industry dedicated to spindles for furniture. And she hadn't traveled all that way to turn chair and table legs. "I wanted to be a bowl turner like Bob Stockdale and others I admired," she recalls.

Bowls, though, weren't in the cards. Yet, Gail ended up in an enviable learning situation.

"There was a company called Matloe Woodturning," she explains. "Dave Wilcox ran the woodturning shop. He had been trained in England and was without a doubt the best woodturner I'd ever seen. He had four other woodturners, all young men in apprenticeship. I'd never turned anything between centers in my life, but Dave took me under his wing and clued me in on a couple

on the



Above: The freshly turned newel posts on the cart are destined for installation on a restoration staircase in San Francisco's Pacifica district. Behind are balusters for a Victorian porch railing.

Below: Gail turned hundreds of Victorian balusters for Oakland's Preservation Park. The entry stairs of the Remillard House display another one of the many styles of turnings used in the Victorian era.

of things. One was 'Forget bowl turning. Between centers is where the work is.' The other thing was that I had better learn to turn his way, or not at all. So I became his protégée, and he became God."

According to Gail, the overhanded turning technique she learned (with her left hand on top of the tool shaft) provides more control. It took a while to master. "I soon discovered that when you make a mistake in spindle turning, it produces a click sound. And when the other turners heard me make it, they would harass me with catcalls. It was all good-hearted, but pressure just the same."

Gail stayed at the lathe in Auckland for a year and a half before deciding that it was time to leave. In 1976 she returned home with new skills.

Round and round: The business of woodturning

Back in the Bay Area, the newly trained turner soon found a job at the Haas Wood & Ivory Company, a San Francisco firm that specialized in architectural woodturning. As Gail recalls, "Their master woodturner was an elderly Italian. Even though he had learned woodturning in Italy, his style was very much like that of Dave Wilcox, the Englishman I learned from in New Zealand."

And there was little difference between the work, except for the wood. Down under, Gail had turned strictly mahogany. In San Francisco, it was redwood and a little poplar. "But there were the same beads, flats, coves, ogees, and vase-shaped designs," she says. "Once you have the shapes down, the material doesn't matter much. A spindle is a spindle, whether it's a table leg or a baluster. It's all spindle turning." Gail remained there about a year before she was laid off due to a slowdown in business.

Inspired by necessity, she decided to set up shop. "I bought my first lathe from an old machinist I'd met in New Zealand," she says. "When it arrived, a cabinetmaker friend of mine built the bed. It took a number of months to get the shop going, even after I bought a bandsaw, sander, drill press, and other tools."

To drum up work for her turning business, Gail went door-to-door in San Francisco, calling on architects, contractors, and interior designers. She printed flyers and cards, and sought referrals. "I'd see about four or five people a day," she remembers. "In those days, 50 balusters would have been a huge order, but I'd get 30. I'd see a contractor working on a Victorian building and introduce myself. To this day I've still got customers I met that way."

More than 20 years later, Gail speaks with a confidence built from experience. "When I first started, I charged $15 per hour and it took me 25 minutes to turn a baluster. But you learn to get

Continued

A PRO AT PRODUCTION

fast when you go into business for yourself," she says, smiling. "Now, I get about three times that and do one in from 8 to 15 minutes, depending on its intricacy."

Architectural turnings for restorations represent about 80 percent of Gail's work. Yet, she still maintains one motto that states, "No job is too small." So she turns everything from table legs to door and cabinet pulls.

Twenty-three years of woodturning has, however, made her more selective. "I've paid my dues doing the grunt work," the woodturner laughs. "Now, I let my helper do all the boring production jobs. I do the setup and turn the first one, then leave him alone. Otherwise, I like the small runs and the prototype jobs that have to be accurate. A woodturner has to have a good eye and be able to measure a sixteenth of an inch at a glance. That's why I do the intricate things. I also turn all the big stuff, like porch posts. And I conduct the business."

Turning "big stuff" is the main reason that Gail has always had shop space in conjunction with a cabinetmaker or furnituremaker. "At times I need big machines to saw, plane, or joint and get my wood to finished rough dimensions," she explains. For the past 14 years Gail has followed that philosophy by renting space from Richard Gatti, a locally renowned furnituremaker who specializes in high-end commission pieces.

Tools made to last

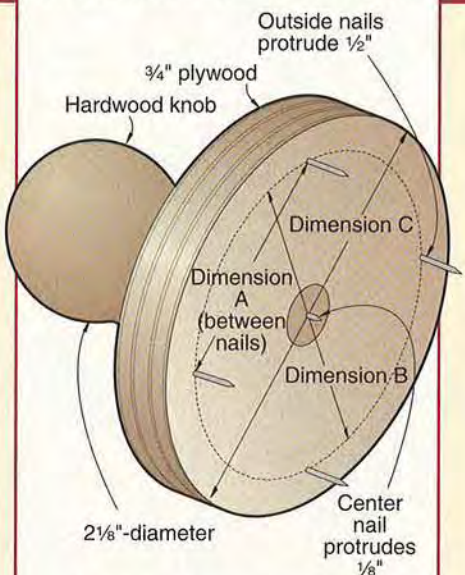
Gail's first lathe still occupies space in her woodturning shop as a fond reminder of New Zealand. Her assistant now uses it.

The focus of her turning, though, is the 8½'-bed Dominion lathe. The warning label that reads "Do not adjust whilst machine is running" indicates its English origin.

"A friend of mine had told me about the company, so I called them in Halifax and had it built to my specifications," notes Gail. "When they were putting it together, I had to talk to them a lot because they had never made a lathe with variable speed before."

With the clear vision of hindsight, Gail now wishes she had

SHOP-MADE CENTER FINDER



	A	B	C
5½"	4 3/16"	5 7/8"	7 3/8"
3½"	2 13/16"	4"	4 7/8"
2½"	2 1/16"	2 15/16"	3 7/8"
1½"	1 1/2"	2 1/8"	2 7/8"

Gail uses these easily built tools to quickly find and mark the centers of stock-dimension turning squares. Simply place the finder over an end of the wood, move it around until it fits snugly, then press or tap the knob to mark the center.

What turning tools do you need? Gail has some advice

For a basic set of woodturning tools, Gail suggests the following: "For roughing out small stock, such as a 3×3, I suggest a 1" gouge. But if I had to have only one tool, it would be my ½" gouge because I can do everything with it. Of course, it would take me longer, but I could do it all—coves, beads, even flats—they wouldn't be as flat as if I did them with a skew chisel, but it will work. Then, I'd add a ⅜" gouge, and a good parting tool. And always buy decent tools made of high-speed steel."

Gail has her turning tools handmade in New Zealand of high-carbon steel. She turns the plain, but hardworking, long-and-strong handles that she prefers.

ordered a 10' bed. She has lost business because she couldn't turn 10' posts. But all in all, she's satisfied. "For $6,500 I got everything, including the shipping," she adds. "The American equivalent would be an Oliver, and they start at about $10,000."

Many, if not most, production woodturning shops employ duplicating lathes. Gail only briefly thought about following suit. "I looked into buying one after I got hurt one time," she says. "But I must admit I don't have a knack for mechanics, and that machine put me off a bit. Then I said, 'Hey, I don't want to be automatic.' I was trained to be a turner, and that would be a sellout."

Gail's gouges are as trusty as her lathes. "The originals of these were handmade in New Zealand," she says, pointing to her tools arranged on the lathe bed (as shown *opposite page*). "You can't find anything like them on the market. They're all milled from bar stock and hardened. Mostly I use a 1½" gouge for roughing, a ⅝" for 6×6s, and a ½" for 4×4s."

Looking at the shafts, she comments, "They were all probably 10" long when I got them. I wear them down to 3" before I throw them out." The tools have stout handles about 14" long.

"Lots of turners have these fancy handles made from exotic woods. They're like works of art," she comments. "But I'm a nuts-and-bolts type of gal. I don't have time for those arty things. Tools with long, strong handles give me something to hold on to that I can count on for big work. A short-handled gouge is fine for intricate cuts like finials for furniture and drawer pulls.

"I'm not a purist, either," she continues. "I have a real feel for woodturning, and how things are going with the wood. Sometimes I'll get in there with a bullnose for a long deep groove rather than a ⅜" gouge because I don't want to take the chance of blowing the wood out."

How to hone a gouge

"First, you want a fairly long bevel. Otherwise the steel heats up too quickly," notes Gail. "And avoid grinding it to a pointy shape. You won't be able to use all of the edge.

"But don't grind to sharpen," she adds. "A set of turning tools lasts me about 10 years because I don't grind them much. To sharpen a tool, I just hone—a couple of times a day turning cedar. I use a thin, fine Indian oilstone, like the Norton FX34. As lubrication, I use two-thirds machine oil mixed with one-third kerosene. Wet the stone with the oil and run the gouge down it, using as much of the stone as possible. When oil appears on the gouge tip, you're there."

"Keep a loose wrist as you push the bevel along the stone," Gail instructs. "When you see oil on the tip, you've sharpened enough on that pass."

She does it right the first time

Besides "There's never a job too small," Gail has another business credo to guide her. "Do it once and do it right."

"When you cut corners on a job, it always comes back to haunt you, whether it be the quality of the turning, or in particular, the quality of the wood," advises the turner. "Selecting the best wood for the job is really important."

Gail admits that when she first started her own business, she did everything she could to keep her prices down, including using some inferior wood. "If the wood has a little too much moisture, it will check after it's turned," she comments. "If it has sap pockets, they'll eventually bleed to the surface. And knots speed decay."

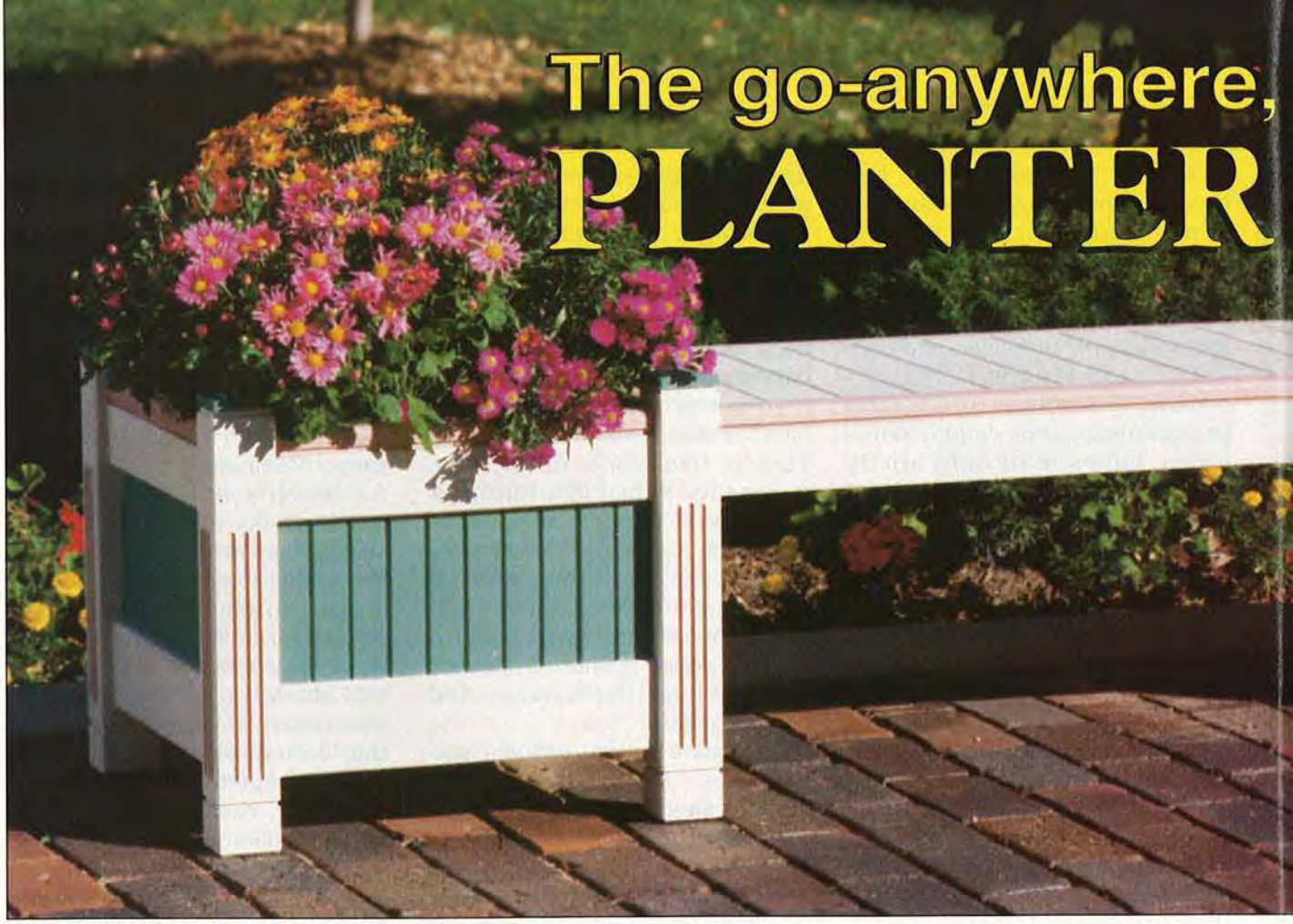
At first, redwood was Gail's wood of choice for exterior turnings. As the clear, straight-grained wood of old-growth timber began being replaced by lesser quality second-growth wood, however, she switched. "Redwood started getting pricey, and ecologically incorrect, so I bailed out of that market and began using Western red cedar," she explains. "I buy green red cedar—all first growth out of Vancouver Island, Canada. Then, I have it kiln-dried."

In the past few years, Gail has also bought salvaged lumber—old-growth redwood 6×12s and 8×8s reclaimed from bridges and buildings, then resawn. "Redwood not as good costs $30 a lineal foot in the lumberyard," she says. "I get salvaged redwood for half of that. It all boils down to where I can get the best-quality stock, especially in 4×4 and 6×6 dimensions. I can't deal with defects.

"The name of the game for me is to do a clean job quickly, without losing quality," she says pointedly. "It's a dog-eat-dog business situation here. There are too many woodturners in San Francisco for me to get fancy."

Written by Peter J. Stephano Photographs: Dan Sullivan Drawing: Roxanne LeMoine

The go-anywhere, PLANTER



Our modular planter/bench can take on many shapes, as shown in the design options on the opposite page. If seating's not a problem, just build a few planters for some welcome plant holders for your patio or deck. Lots of options, take your pick!

Let's start with the legs

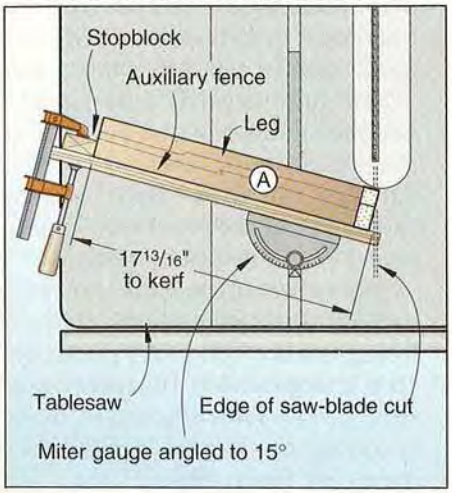
1 To form the 2½"-square legs (A), start by crosscutting nine pieces of 2×6 cedar stock to 18" in length. Then, rip each piece of 2×6 centered down the middle. Using an exterior adhesive, glue the 18"-long pieces face-to-face.

Note: *Forming of the legs involves several setups. To eliminate ruining a leg, we used the extra leg to test the cuts before machining the eight good legs.*

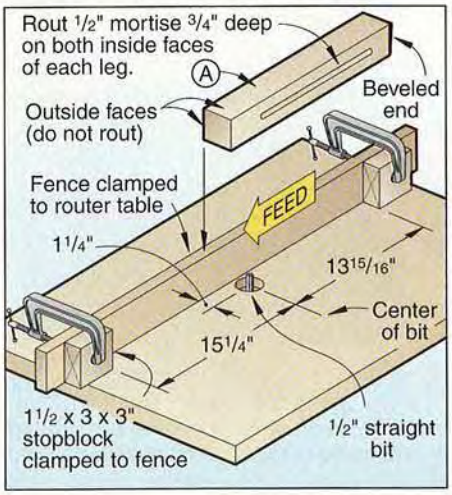
2 After the glue has dried, scrape off any excess, and rip each lamination to 2½" square. Then, trim to 17½" long.

3 To cut the 15° bevels across the top end of each leg (A), attach a long extension to your miter

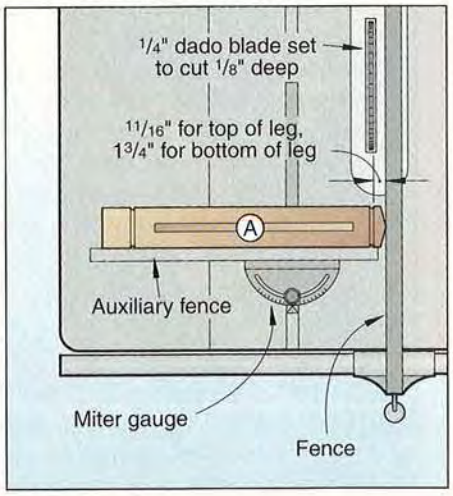
CUTTING THE BEVELED TOP



ROUTING THE MORTISES


Rout 1/2" mortise 3/4" deep on both inside faces of each leg.
A
Beveled end
Outside faces (do not rout)
Fence clamped to router table
FEED
1 1/4"
13 15/16"
Center of bit
15 1/4"
1 1/2 x 3 x 3" stopblock clamped to fence
1/2" straight bit

CUTTING THE DADOES



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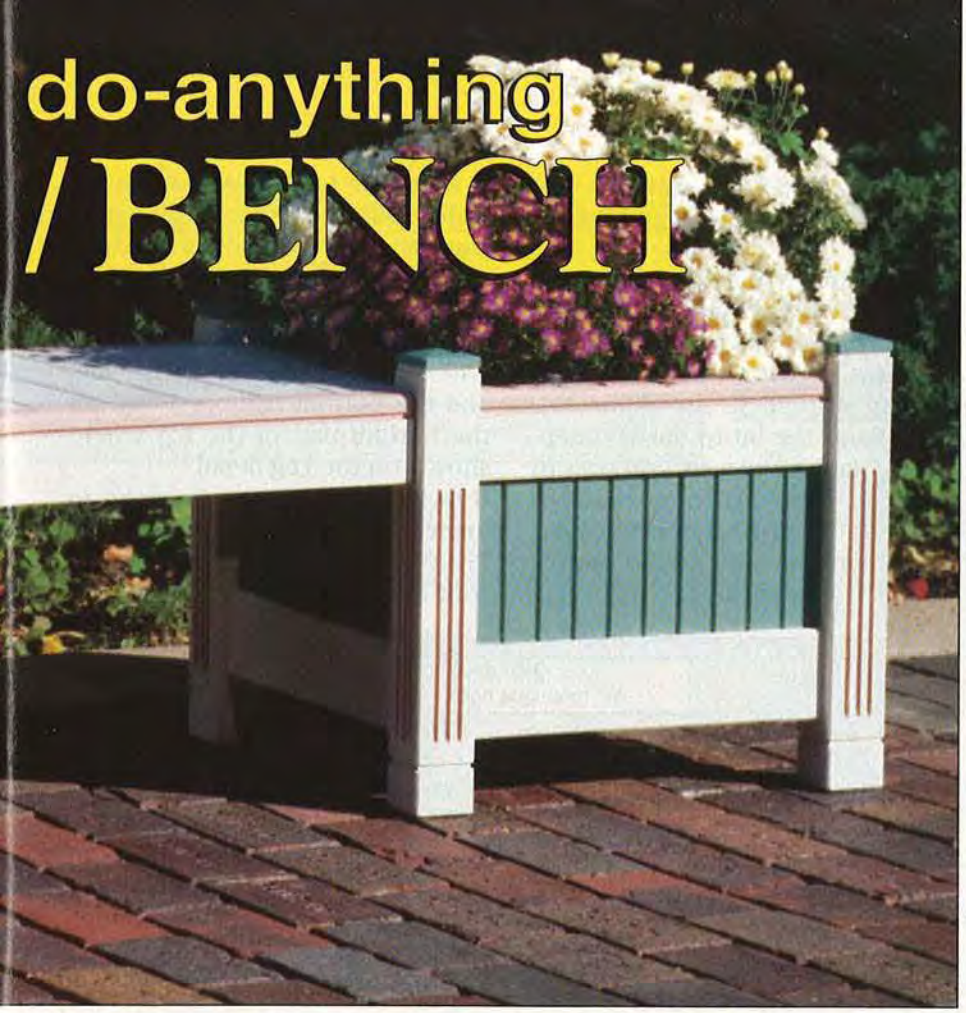
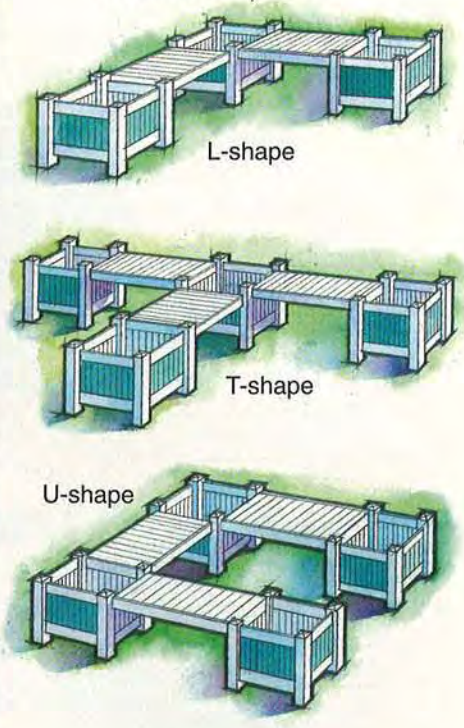
do-anything /BENCH



DESIGN OPTIONS

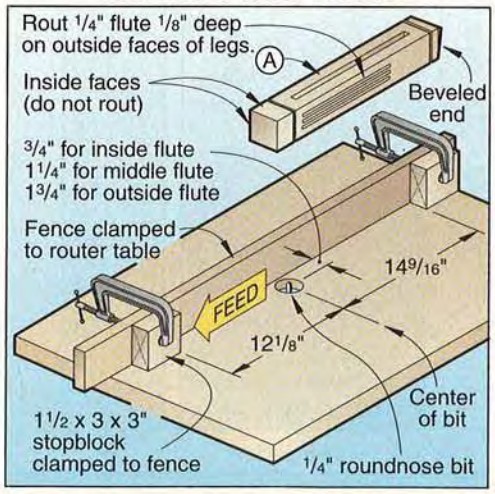


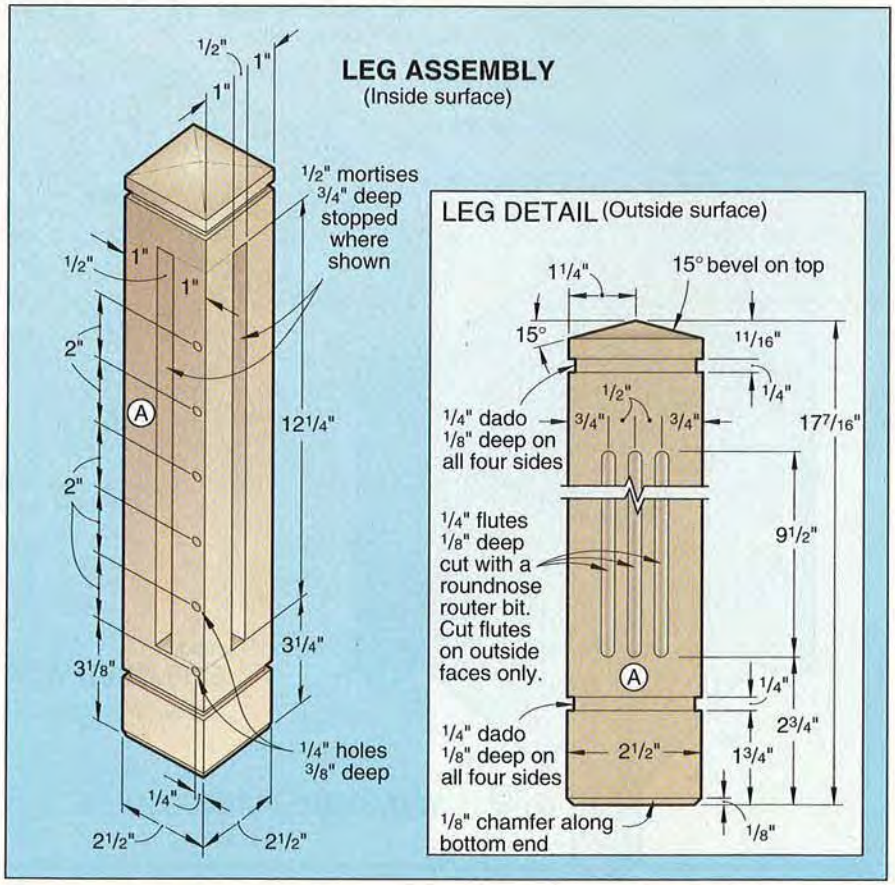
gauge, and angle it 15° from your tablesaw blade where shown on Cutting the Beveled Top drawing. Now, attach a stopblock to the extension where shown.

4 To prevent chipout, wrap masking tape around the end of the leg to be mitered. Then, make four mitercuts across the top end of each leg, trimming each to its

Continued

ROUTING THE FLUTES


Rout 1/4" flute 1/8" deep on outside faces of legs.
A
Inside faces (do not rout)
Beveled end
3/4" for inside flute
1 1/4" for middle flute
1 3/4" for outside flute
Fence clamped to router table
FEED
14 9/16"
12 1/8"
1 1/2 x 3 x 3" stopblock clamped to fence
1/4" roundnose bit
Center of bit



PLANTER/BENCH

17 7/16" finished length. Remove the remaining masking tape.

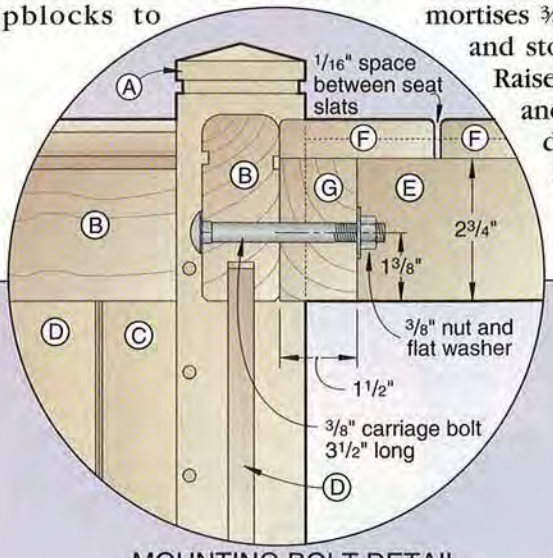
5 Fit your table-mounted router with a ½" straight bit set to cut ⅜" deep. Now, clamp a fence to your router table, and then clamp two stopblocks to the fence where shown on Routing the Mortises drawing on *page 36*.

6 Mark the two inside surfaces of each leg, putting the best two surfaces *opposite* these. Rout the ½" mortises ⅜" deep using the fence and stopblocks for alignment. Raise the bit to cut ¾" deep, and make a second pass to deepen the mortises to their final depth. Chisel the ends of the mortises square.

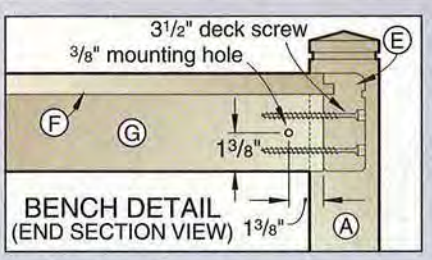
7 Fit your tablesaw with a ¼" dado blade and miter-gauge extension, and cut ¼" dadoes ⅛" deep across all four surfaces of each leg where shown on the Cutting the Dadoes drawing. The top dado is 11/16" from the top end of the leg, and the bottom dado is 1¾" from the bottom end of the leg where shown on the Leg detail.

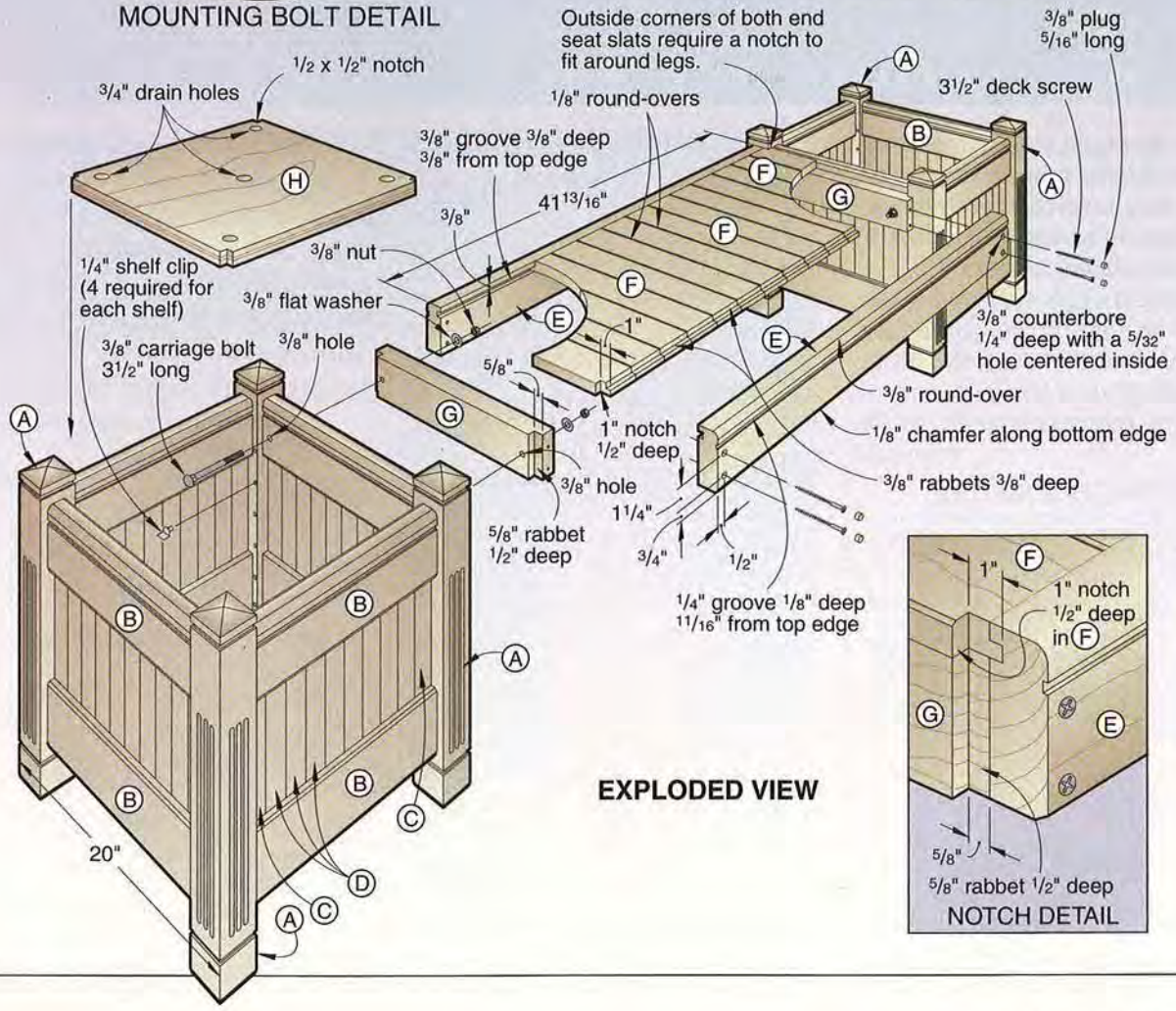
8 Switch to a ¼" roundnose bit in your table-mounted router. Position the fence and stops, and rout a ¼" flute ⅛" deep along one

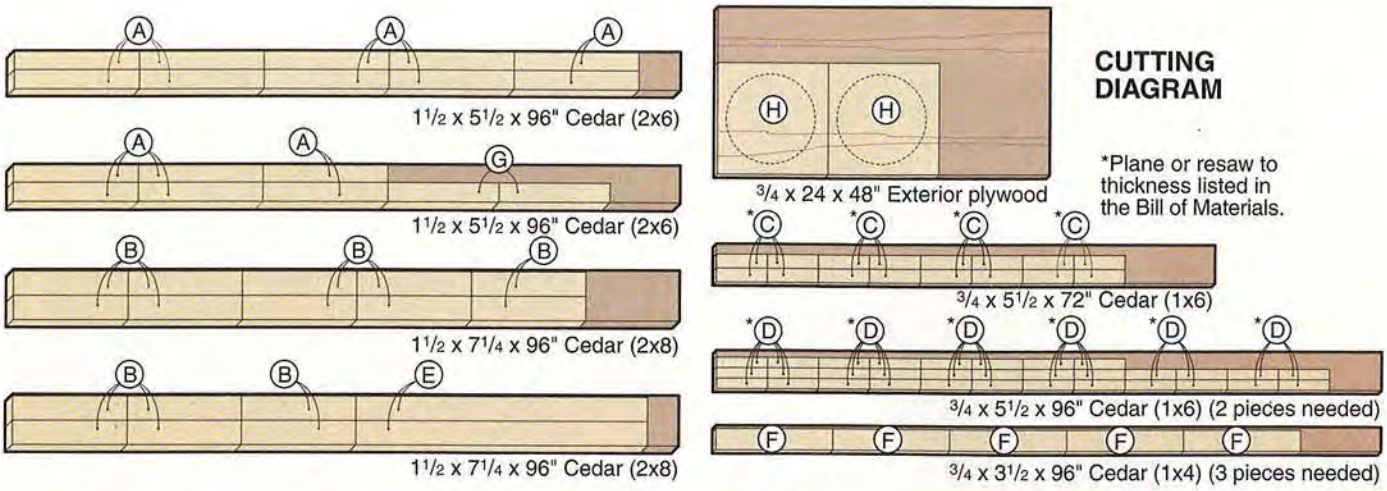
Continued



MOUNTING BOLT DETAIL

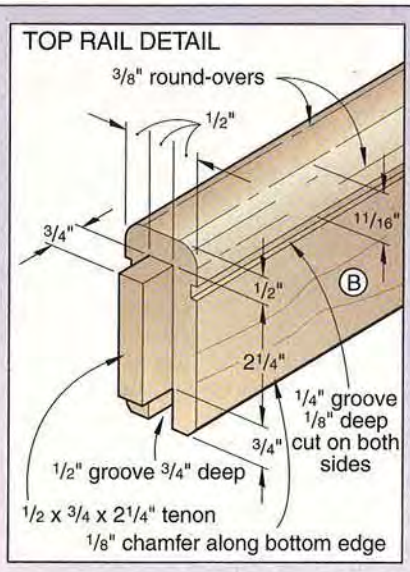


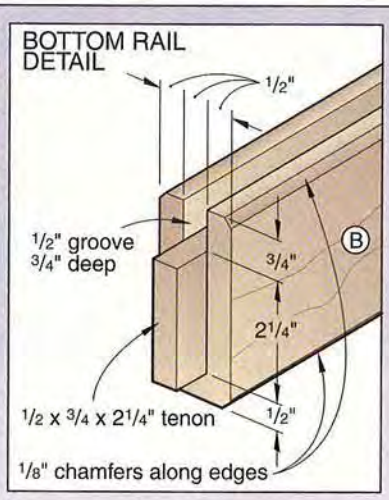




CUTTING DIAGRAM

*Plane or resaw to thickness listed in the Bill of Materials.





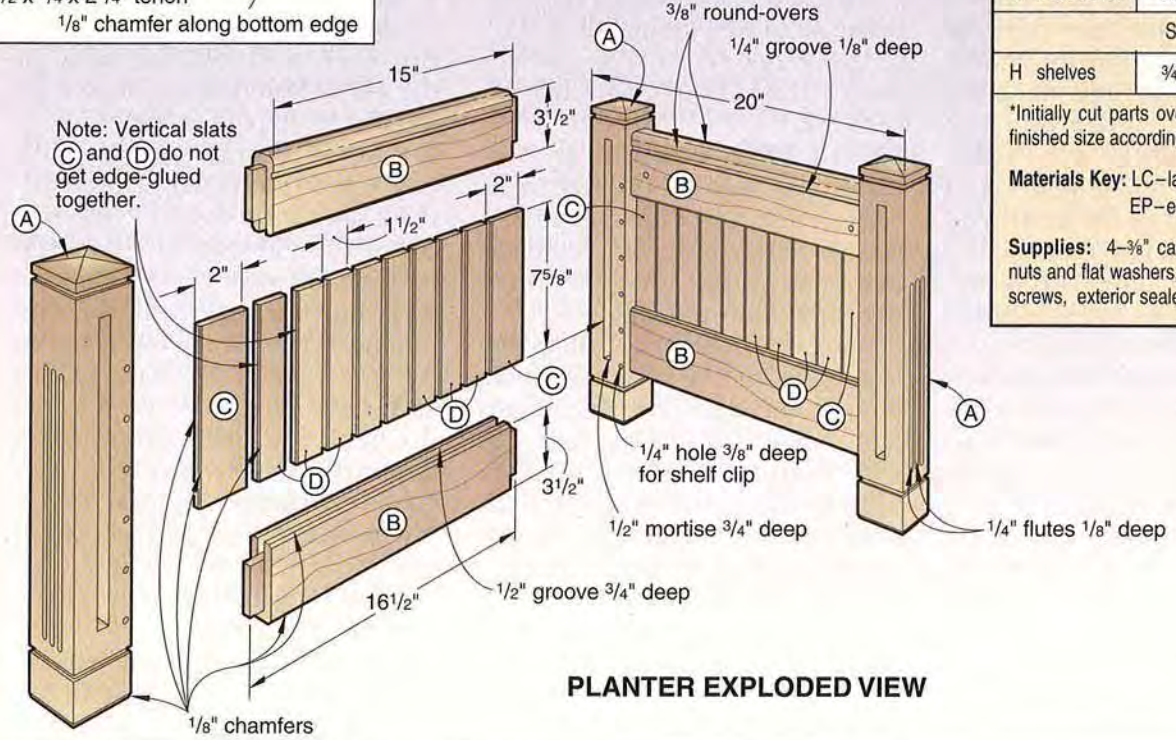
Bill of Materials

Part	Finished Size T	W	L	Matl.	Qty.
PLANTERS					
A* legs	2½"	2½"	17 7/16"	LC	8
B rails	1½"	3½"	16½"	C	16
C slats	½"	2"	7⅝"	C	16
D slats	½"	1½"	7⅝"	C	64
BENCH					
E rails	1½"	3½"	41 13/16"	C	2
F slats	¾"	3"	16¾"	C	14
G frame ends	1½"	2¾"	16"	C	2
SHELVES					
H shelves	¾"	15¾"	15¾"	EP	2

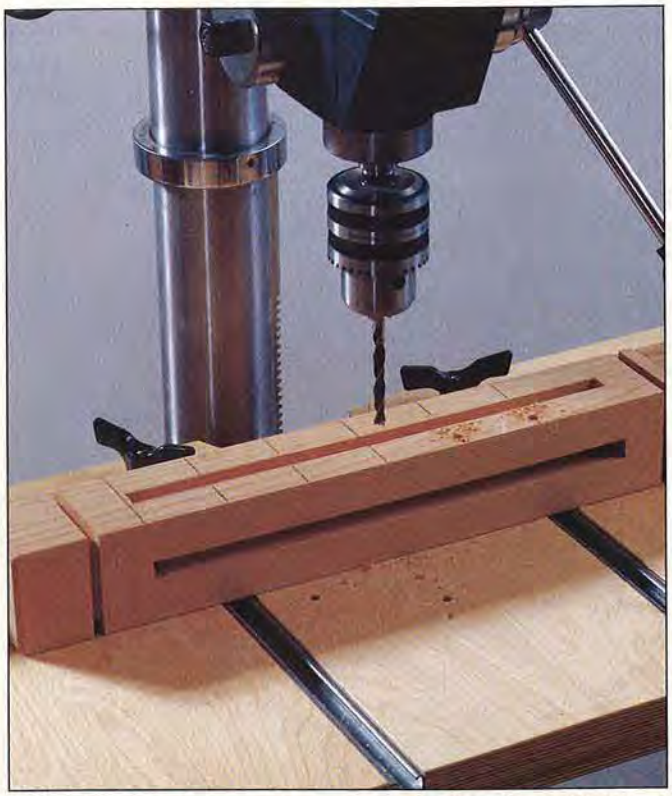
*Initially cut parts oversized. Then, trim each to finished size according to the how-to instructions.

Materials Key: LC–laminated cedar, C–cedar, EP–exterior plywood

Supplies: 4–⅜" carriage bolts 3½" long with nuts and flat washers, 8–¼" shelf clips, 3½" deck screws, exterior sealer or primer and paint.



PLANTER EXPLODED VIEW



Drill ¼" holes where marked on each leg for the shelf pins. A fence on your drill press ensures alignment.

When assembling the planter end frames, be sure to square them as you tighten the clamps. The slats float in the end frame.

surface *opposite* the surfaces with the routed mortises. See the Leg detail and Routing the Flutes drawing on the *previous page* for reference. Reposition the fence, and rout a second flute along the same surfaces, but along the opposite edge of the leg. Finally, reposition the fence again, and rout the third flute centered between the first two flutes.

9 Rout a ⅛" chamfer along the bottom edges of each leg. See the Leg detail for reference.

10 Position the eight legs (A) side by side, with one ½" mortise facing up, and the other mortises facing you. Using a framing square align the bottom ends of the legs. Now, use the square to measure and mark the ¼" holes for the shelves on the top surface of each leg. Using a fence on your drill press for alignment, drill a ¼" hole ⅜" deep at each marked line as shown in the photo *above*.

Now, machine the top and bottom rails

1 Cut the top and bottom rails (B) to the size listed in the Bill of Materials. Rout or cut a ½" groove ¾" deep, centered along one edge of each rail.

2 Cut rabbets along the ends of each rail to form tenons to fit snugly into the mortises in the legs as dimensioned on the details accompanying the Planter Exploded View drawing.

3 Rout ⅜" round-overs along the top edges and ⅛" chamfers along the bottom edges of the eight rails (B) you'll use for the top rails. Cut a ¼" decorative groove ⅛" deep next to the round-overs on both sides of each top rail where shown on the Top Rail detail.

4 Rout ⅛" chamfers along all edges of the bottom rails (B) where shown on the Bottom Rail detail accompanying the Planter Exploded View drawing.

Cut the slats, and secure them between the rails

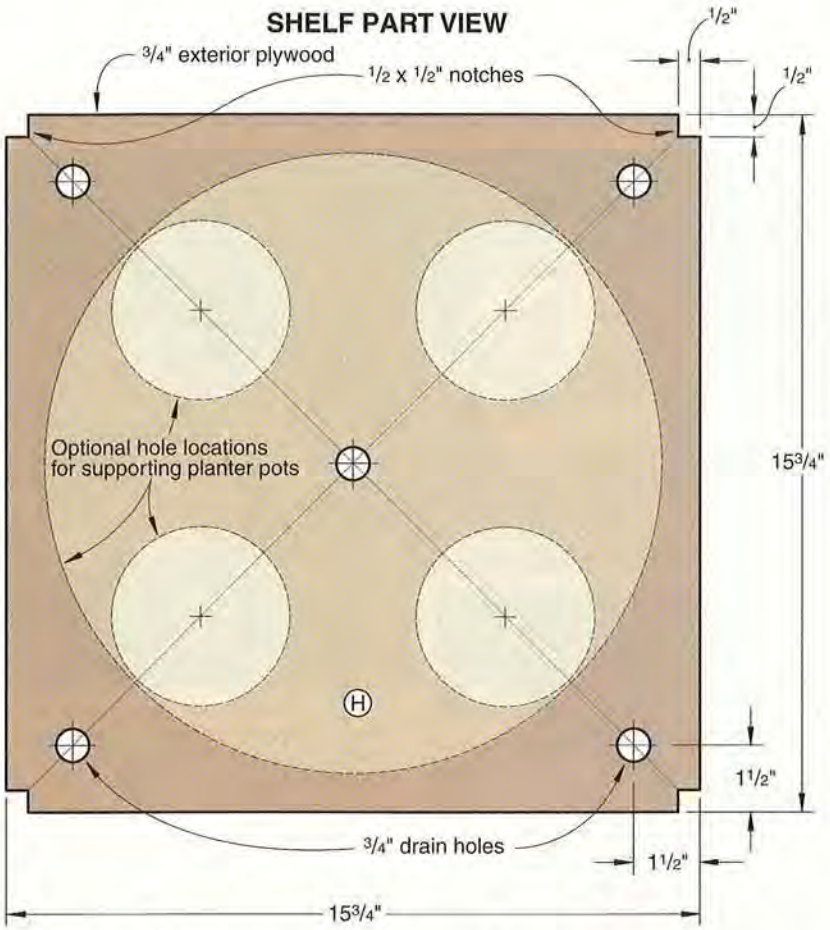
1 Resaw or plane stock to ½" thick for the slats (C, D). Then, rip them to the widths listed in the Bill of Materials and shown on the Planter Exploded View.

2 Rout ⅛" chamfers along both edges (not the ends) of each ½"-thick slat (C, D).

3 With a wide slat (C) on each end, fit the slats (no glue necessary) into the groove in the bottom rail. Then, fit the top rail onto the top ends of the slats. Clamp and check for square.

4 Check the fit of the rail/slat assemblies between the legs. Glue and clamp a rail/slat assembly between two legs as shown in the photo *above*. Check for square. Repeat for the three remaining end panels.

5 Glue and clamp the remaining rail/slat assemblies between the planter end panels (A, B, C, D).



It's time to add the bench assembly

1 Cut the bench rails (E) to size. Then, rout the round-overs and chamfers, and cut the grooves in the rails where shown on the Exploded View drawing and accompanying details.

2 Cut the bench slats (F) to size. Then, cut rabbets across the ends of the slats to fit into the ⅜" groove on the inside face of the rails (E). Next, rout ⅛" round-overs along the edges, but not the ends, of the slats.

3 Cut the bench-frame ends (G) to fit between the rails (E). Cut rabbets across the ends to fit between the legs (A) of the assembled planters where shown on the Exploded View drawing and accompanying Notch detail.

4 Dry-clamp (no glue) the bench assembly (E, F, G) together. Cut notches on the slats (F) at each end of the bench assembly where shown on the Exploded View drawing. Now, check the fit of the clamped-up bench between the planters, and adjust if necessary. Remove the clamps and separate the pieces.

5 Drill a pair of ⅜" holes through each frame end (G) where dimensioned on the Bench detail accompanying the Exploded View.

6 Clamp a bench-frame end (G) to one of the planter assemblies so the bottom edge of the end (G) is flush with the bottom edge of the top rail (B) where shown on the Mounting Bolt detail accompanying the Exploded View drawing. Use the previously drilled holes in the end (G) as guides to drill the same-sized holes through the rail. Repeat for the other frame end and remaining planter.

Let's assemble the bench

1 Fit the slats (F) into place between the rails (E), using 1/16" strips as spacers between the slats to test the fit and check for equal gaps. Trim if necessary. Then, glue and clamp the slats in place, wiping off any excess glue immediately. We used a ¼" acid brush to apply the glue to the grooves in the rails (E). Now, glue and clamp the end rails (G) in place. Check the bench assembly for square.

2 Drill a pair of counterbored mounting holes at each end of the bench rails (E) and into the ends of the mating rails (G). Drive deck screws to secure each joint.

3 Cut ⅜" plugs ⅜" long, and glue into the counterbores over the deck screws. Sand the plugs flush.

4 Cut the planter shelves (H) to shape using the Shelf Part View drawing for reference. Now, drill five ¾" drain holes in each shelf. You can either set your pots directly on the shelves in the planter boxes, or cut holes into the shelves to fit your particular pots. To extend the life of the planters, put potted plants in the planter boxes on the shelves. We do not recommend filling the planter boxes directly with dirt.

Finish and enjoy

1 Completely seal the project with a clear exterior finish, or prime and paint the planters and bench as desired. Pay particular attention to sealing the bottoms of the legs (A). (We used True Value's Tru-Test colors from their Exterior Historical Collection of Victorian Era Colours. We used sedge for the main color, seahurst for the panels and post caps, and cameo rose for the top of the rails and flutes.)

2 Bolt the seat assembly between the planters. Determine the shelf height, and add the shelf pins and shelves. Finally, add the potted plants and have a seat.

Written by Marlen Kemmet Project Design: James R. Downing Illustrations: Kim Downing Photographs: Hetherington Photography

What a difference

Spend a day in Mark Tudor's THE WOODWORKERS' PLACE

Above: **"Finished!" Adult students in Mark Tudor's one-day woodworking class celebrate the completion of their Adirondack chairs. (That's me, third from the left.)**

Left: **Mark Tudor, founder of The Woodworkers' Place, shows off the projects of his various one-day classes. They include a potting bench, a sofa table, a mission lamp table, an Adirondack chair, a firewood carrier, and a Shaker bench.**

Recently, I had the chance to get out of the office and spend a day in one of Mark Tudor's woodworking classes. What a kick! There were actually two classes scheduled for that Saturday; I could build either a potting bench or an Adirondack chair. Since I'm not much of a gardener, I chose the latter, though both designs had their merits.

Jim Harrold
Managing Editor

People living in the Pasadena area in California—particularly woodworkers—now have more to cheer about than the famed Rose Bowl parade and football game. They have craftsman Mark Tudor's "The Woodworkers' Place."

With over 15 years of professional experience under his shop-apron strings, Mark set out to teach the joy of woodworking to interested beginners while providing a full-service shop facility to experienced woodworkers. Mark found the perfect location when he stumbled onto an out-of-service woodworking shop built in 1923 at one of the local middle schools. After working out a lease agreement with the school system, Mark reopened the shop's doors, restoring it to its original function.

Inside the spacious, sun-filled room, Mark discovered several industrial-strength woodworking machines in need of a little tuning. They included a hefty pair of bandsaws, a disc sander, a jointer, a 36"-wide planer, a lathe, and others. To this he added several of his own tools, then hung his sign which proudly proclaims "THE WOODWORKERS' PLACE, A LEARNING EXPERIENCE."

No ordinary woodworking class

Having a great shop environment is one thing, but luring students to come requires a hook. Mark devel-

a day makes

and you really will have something to show for it.

oped a good one that fits right into today's lifestyles. Attend one of his classes, says Mark, and you will "build and take home a completed piece of furniture the same day." He adds, "People are pretty busy. They like the idea that they can make something substantial so quickly and with just limited [woodworking] experience."

Mark makes it easy for novice and experienced woodworkers to succeed. He offers a variety of popular one-day project classes (see *opposite page*) and a few two-dayers. He assigns class dates to each project (usually a Saturday). But in order for students to enroll in a project-building class, Mark requires them to take his three-hour tool use and safety course.

When students show up for class, they receive all of the materials—screws, glue, and wood—and tools needed to complete their project. Mark figures these, along with building rental and instructor fees, into the class cost. Single-day project-building classes run around $160, lunch not included.

So what's in it for students?

Adults enjoy their time at The Woodworkers' Place. "For one thing," says Mark, "they find a friendly environment that they can escape into." As the day progresses, they face a constant stream of woodworking tasks. "Students learn mortise-and-tenon joinery, biscuit joinery, how to work with patterns, all while using a full range of shop tools." And they meet people.with similar interests.

Because classes are small (Mark limits them to eight students), everyone receives lots of individual help. If it's not Mark, then it's his father Dwight, or another craftsman/teacher. The classes focus on machining project parts and assembly skills rather than tool setup. Mark or one of the other craftsmen/teachers do this for the students, keeping one step ahead of the class. "People want to spend most of their time on the machines. That's what they come here for, so that's how I structure the class," says Mark.

Finally, at the end of 8 or 9 hours, students leave the workshop with a pretty impressive project in their arms. If you are interested in Mark's program, give him a call at 818/584-1967.

Let the sawdust fly: a typical Saturday at The Woodworkers' Place

8:30 Class begins

The last of the six students signed up to build the Adirondack chair arrives. Mark chats about safety and his game plan for building the chair. He then divides the students into teams of two and assigns each pair to a workshop table. On these are tape measures, pencils, squares, and rough-cut boards ready for patterning. Since the chair has many patterned pieces, our first order is to trace out the parts prior to cutting. *Above left*, Mark speeds the work by providing student Jeff Ryder with the hardboard pattern template for the arm/leg assembly. That way, all patterned parts remain consistent.

9:40 Things take shape

Students turn to the stationary power tools to cut their patterned pieces to shape. Jennifer Nielson, *above right*, trims one of the chair arms on the shop's 20" bandsaw, one of the tools remaining from the school's original woodworking shop. As the morn-

Continued

What a difference a day makes

ing continues, more parts are cut to shape and chair subassemblies built using screws, glue, wood biscuits, and plenty of enthusiasm.

2:35 Shop jigs to the rescue
At intervals throughout the day, Mark instructs the group on the next construction stage. To ensure that the production work moves smoothly and that parts are machined accurately, he includes problem-solving jigs in many of the machining processes. Here, *above left,* Mark holds down one of his custom-made router jigs while I rout dadoes in a chair seat/leg part placed in the jig. Once again, safety and success are guaranteed.

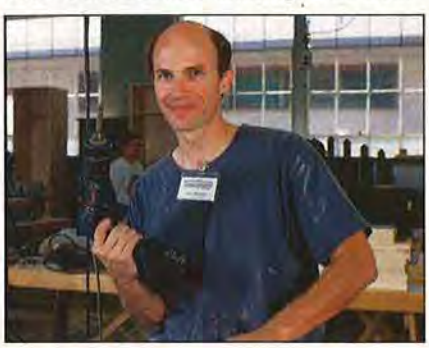
4:10 Time to put it together
Things begin to take shape. Classmates P. J. Hayes and Paula Bush, *above right,* fasten the chair back subassembly to the combined seat/leg/arm subassemblies. Victory is close at hand! Only plugging the countersunk screw-holes remains. Students apply finish to their projects at home.

Graduates sing the praises of their shop experience

Because woodworking was not part of his experience growing up, local TV station news writer Jeff Ryder, *below,* jumped at the opportunity to attend The Woodworkers' Place. "I had recently purchased an older house and wanted hands-on work with tools before tackling projects in the house. Building the chair gave me that chance. I worked with a lot of tools I never used before."

Monrovia resident Amy Earhart, *below middle,* a warehouse and customer service manager in near-by Cerritos, took Mark's very first Adirondack class some three years ago. Now, she's a veteran—this being her fourth class. "I built two Adirondack chairs, one Windsor chair, and the mission lamp table," she explains. "Each time I learn something new or use some different tools." Thanks to Mark's class, Amy has become a full-fledged hobbyist. "Now, I want to build some Craftsman-style furniture using quartersawn oak. It's great having a shop full of tools only 15 minutes away from home." Who can argue with that?

Pasadena high school science teacher Paula Bush, *below,* first tried her hand at woodworking as a child, when her father showed her how to use a handsaw. Then came The Woodworkers' Place. "The Adirondack chair is the first project I ever made, and I'm very proud of it." She also gives high marks for the format. "I like that the classes are small; you get more attention. And I like spending a whole day on a weekend to build a project rather than taking a series of three-hour evening classes." She, too, will be back.



Written by Jim Harrold Photographs: Kenneth Naversen

This Delta exclusive gives you a lock on snipe control. Patent-pending cutterhead snipe control lock stabilizes the cutterhead during operation, for complete rigidity.

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Sat., May 17, 1997
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Lansing
Sun., May 18, 1997
1:00 p.m.
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Pennsylvania

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1758 Allentown Road
Lansdale, PA

Quakertown
Sat., June 7, 1997
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Blvd., Quakertown, PA

Fairless Hills
Sun., June 8, 1997
1:00 p.m.
540 Oxford Valley Rd.
Fairless Hills, PA

Ohio

Stow
Sat., June 21, 1997
10:00 a.m.
835 Graham Road
Stow, OH

Macedonia
Sun., June 22, 1997
1:00 p.m.
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Macedonia, OH

Medina
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AVIAN ACRES

A farmstead for the birds

Here's the kind of place birds dream about: a field of seed. You can build this farmyard feeder fast, then enjoy watching the birds all summer long.

Print this article

The field comes first

1 Cut three pieces of stock ¾×1½×13" for the edgings (A). Rout a ½" rabbet ⅜" deep along one edge of each piece. (We did this with a table-mounted router and ½" rabbeting bit.)

2 Miter-cut the pieces to 12", cutting both ends of one edging and one end on each of the other two (make sure they're opposite ends) to form a U-shaped border with the rabbeted edge inside. (Refer to the Exploded View drawing on *page 49*.)

3 Saw the base (B) to the size shown in the Bill of Materials. Use A-C grade exterior plywood or some other sheet material suited for outdoor exposure. Lightly draw diagonal lines on one face. Mark the lines 2¾" in each direction from the point where they cross. Bore a 2" hole at each of the four marks.

4 Cut the flange block (C) to the dimensions shown. Center the block on the bottom of the base (B), and attach it with glue and four 3d finishing nails. Center a ¾" pipe flange (you'll find one in the plumbing aisle at the hardware store or homecenter) on the block. Mark the mounting hole positions, then drill a 9/64" pilot hole 1" deep at each mark.

5 Glue and nail the edgings (A) to the base (B) where shown. Note that the edging with two miter-cut ends fits along the shorter dimension of the base.

Make a farm for the field

1 Cut an 8×13" piece of ½" exterior plywood. Sand both faces smooth, and apply a coat of white exterior primer to each side. (While you're prime-painting, put a coat on the base assembly you just completed.)

2 Photocopy the full-sized pattern for the farm background (D) on the *following pages*. Trace the pattern outline and detail lines onto the best side of the primed plywood. (Spray on a light coat of Deft clear wood finish afterwards to prevent smearing the lines.)

3 Scrollsaw the outside pattern line. (We sawed ours using a #5 blade, .038×.016" with 14 teeth per inch.) Fill any voids in the sawn edge, then paint the edge with exterior primer.

4 Paint the background scene with acrylic paints. You can follow the color scheme shown, choose your own, or paint the buildings as a silhouette in one dark shade. You can paint the back of the scenic background to match the front, or leave it in primer, then paint it to match the rest of the feeder.

The colors shown are titanium white; mars black; naphthol crimson (red); Christmas green, Apple Barrel craft paint (dark green); jubilee green, Ceramcoat acrylic paint (light green); and

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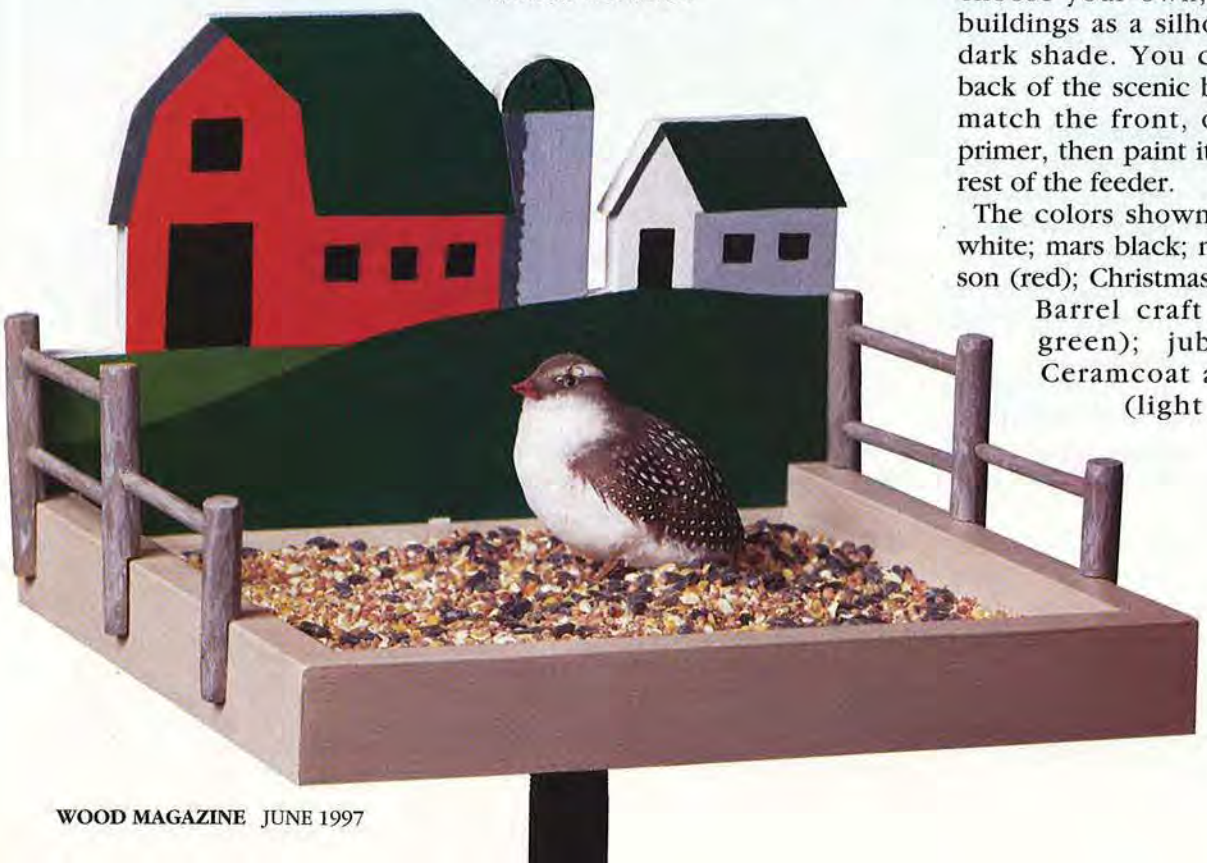


hippo grey, Ceramcoat acrylic paint (dark gray). For the light gray, mix equal parts of hippo grey and titanium white. Where no brand name is specified, the paints are standard acrylic artist's colors, available at art-supply stores.

Run fences along the sides

1 Cut four 3½" lengths and two 2½" pieces from ½" dowel stock for the fence posts. Cut six 4" lengths of ¼" dowel for the rails. (For a rustic look, you could use sticks or twigs of like sizes.)

2 Mark each ½" dowel 1" from one end. At the mark, saw ¼" deep, using a coping saw or dovetail saw. Saw or chisel away the waste to form a rabbet on the end of each dowel.

3 Drill 3/16" holes ¼" deep where shown in each ½" dowel. To hold the dowels steady on your drill-press table, lay them in a V-block.

4 Sand or whittle the ends of the ¼" dowels to fit into the holes in the ½" dowels. Whittle a few irregular spots on all the fence parts for a more rustic look.

5 Glue each fence section together, referring to the Exploded View drawing. After the glue dries, paint the fences gray or brown.

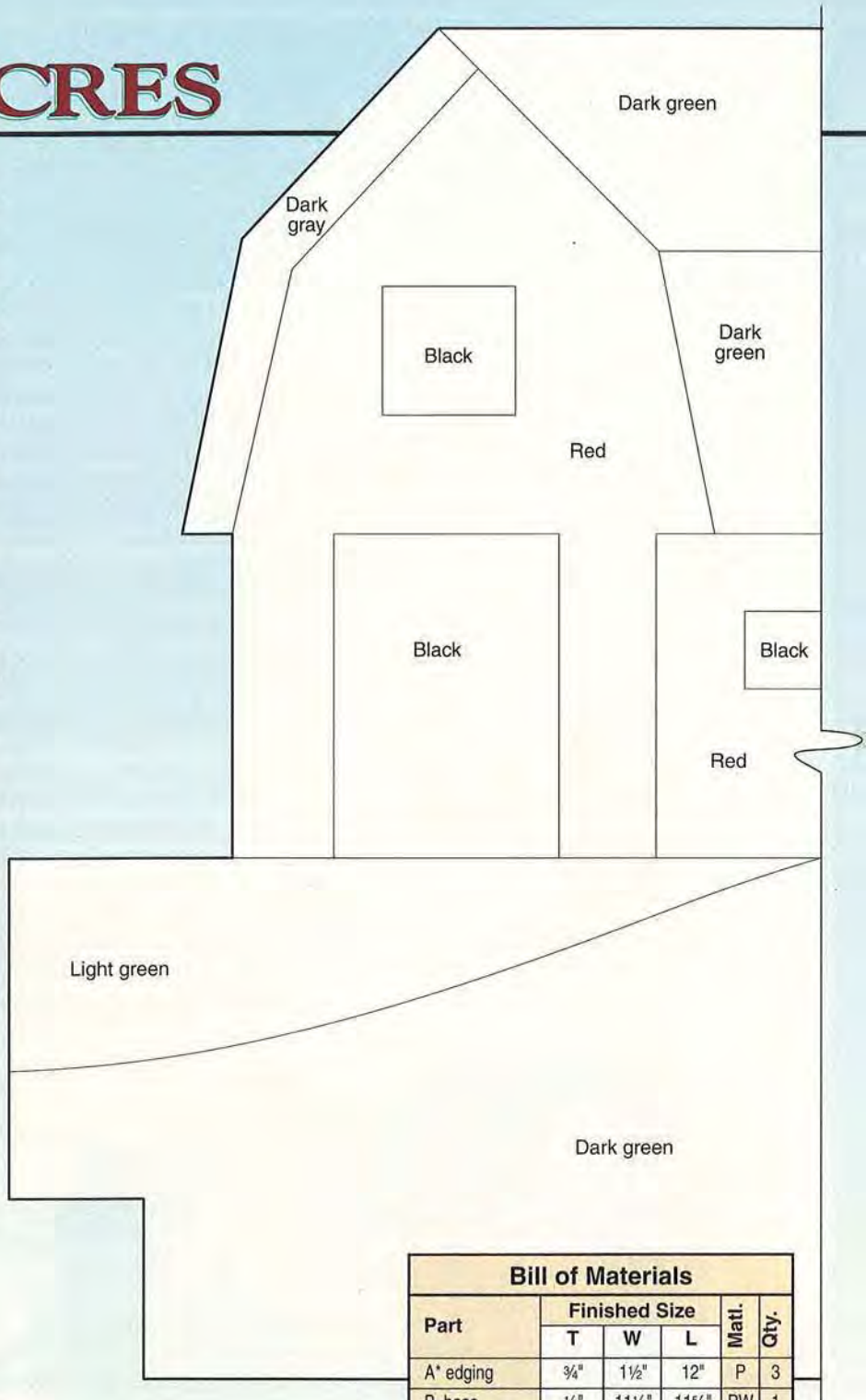
Now, put it all together

1 Paint the field assembly with exterior latex paint. A brown or tan shade of semigloss trim enamel would be appropriate.

2 Attach the pipe flange to the flange block with four #12×1" flathead wood screws.

3 Position the farm in the opening at the back of the field. Fasten it in place with weatherproof glue and brads through the bottom of the field assembly.

4 Cut an 11⅛×11¼" piece of aluminum or steel window screen. Miter-cut four pieces of ⅜×⅜" screen molding or quarter round (E, F) to fit inside the feeder. Lay the screen in the bottom, and fasten it in place with the moldings and #17×⅝" brads.



5 Attach an assembled fence to the edging (A) on each side. Fasten them with glue and brads.

6 To install the feeder, screw a piece of ¾" galvanized pipe about 8' long into the flange. Stand the other end of the pipe in a hole about 18" deep, then pour in concrete to fill the hole. Brace the pipe to hold it vertical until the concrete cures.

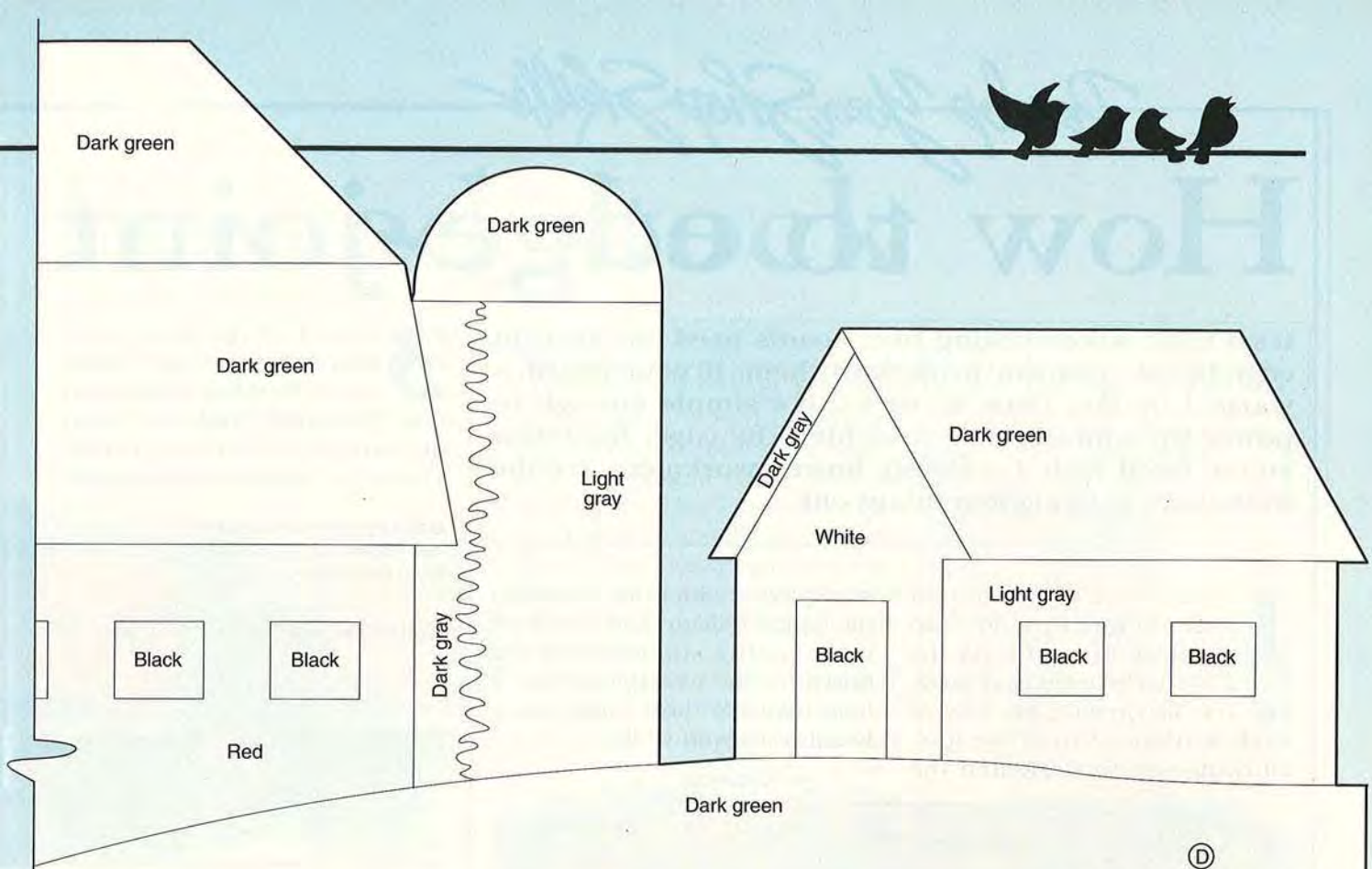
Bill of Materials

Part	Finished Size T	W	L	Matl.	Qty.
A* edging	¾"	1½"	12"	P	3
B base	½"	11¼"	11⅝"	PW	1
C flange block	¾"	3½"	3½"	P	1
D* background	½"	7½"	12"	PW	1
E* side molding	⅜"	⅜"	10⅝"	PM	2
F* end molding	⅜"	⅜"	10⅜"	PM	2

*Initially cut parts oversized. Then, trim to finished size in accordance with the how-to instructions.

Materials Key: P—pine, PM—pine screen molding, PW—exterior-grade plywood.

Supplies: ¼" and ½" dowel stock, window screen, ¾" pipe flange, 3d finishing nails, #17×⅝" brads, #12×1" flathead wood screws, glue, paint.



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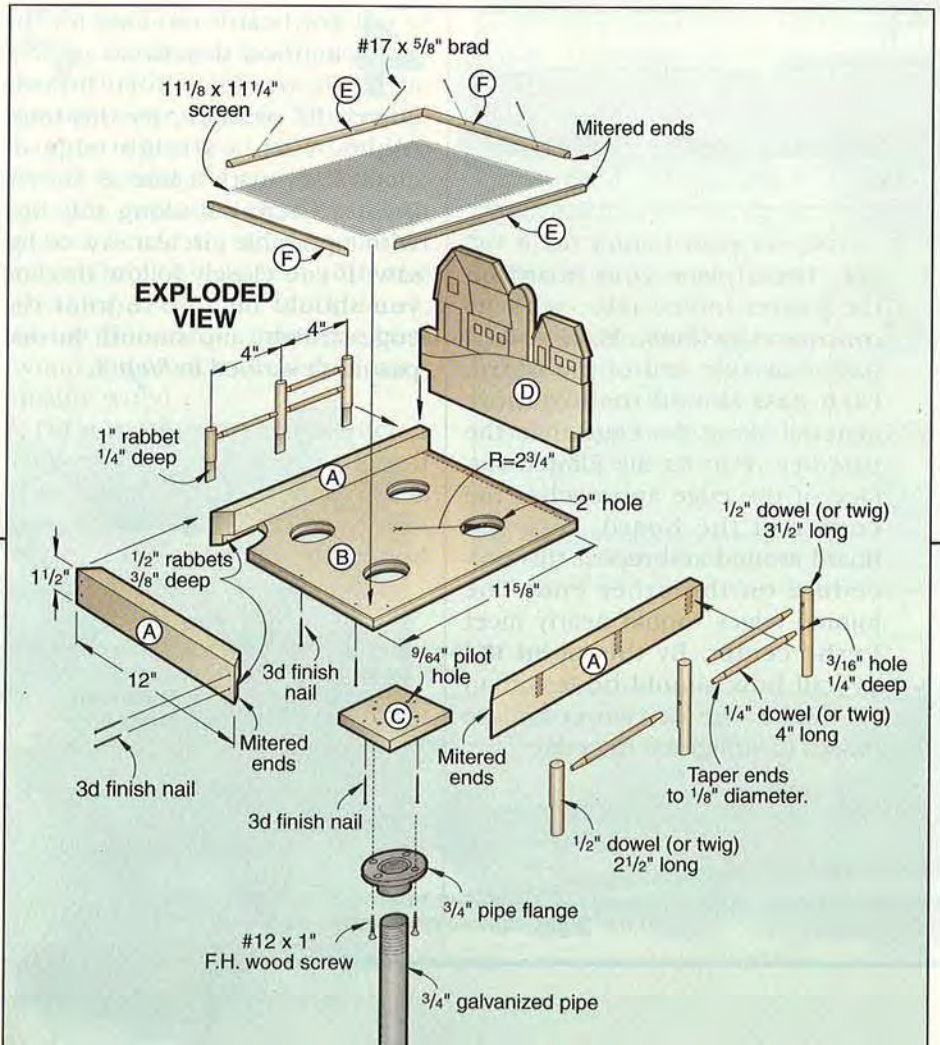
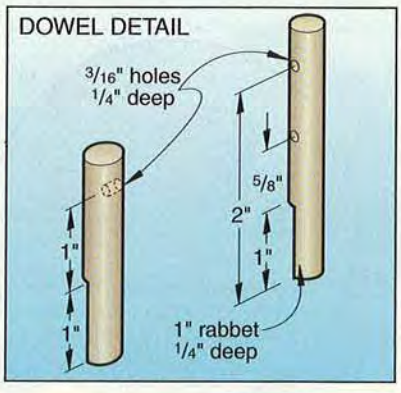
FULL-SIZED PATTERN



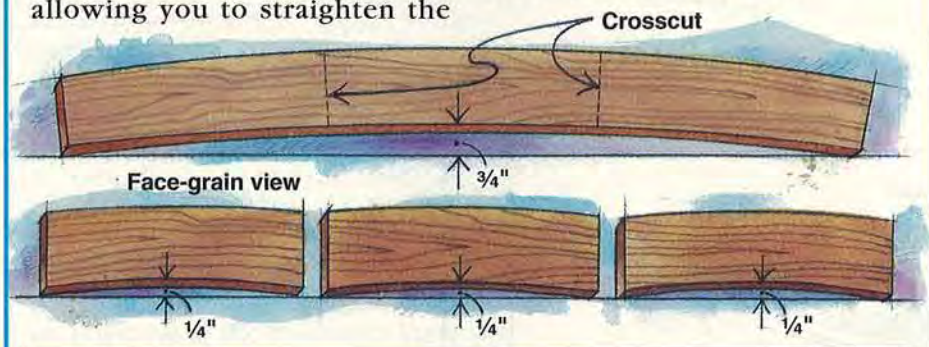
Project Design: David Ashe
Photograph: John Hetherington
Illustrations: Roxanne LeMoine; Lorna Johnson



How to edge-joint

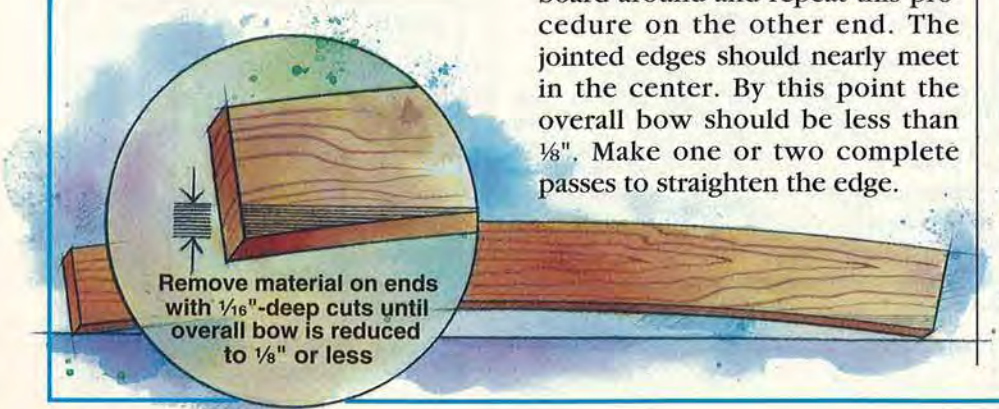
It's a basic woodworking rule: boards need one straight edge before you can work with them. If your board is warped by less than ½" or so, it's simple enough to power up a jointer and straighten the edge. But when you're faced with a seriously bowed workpiece, try the tricks here to straighten things out.

1 Before you joint a board that's bowed by more than ½" along its length, cut the board to shorter lengths, if possible. This may reduce the bow of each workpiece to ½" or less, allowing you to straighten the workpieces with your jointer in the typical fashion. And, you'll get more usable stock out of the board. In the example *below,* a board with ¾" bow yields three boards each with ¼" bow.

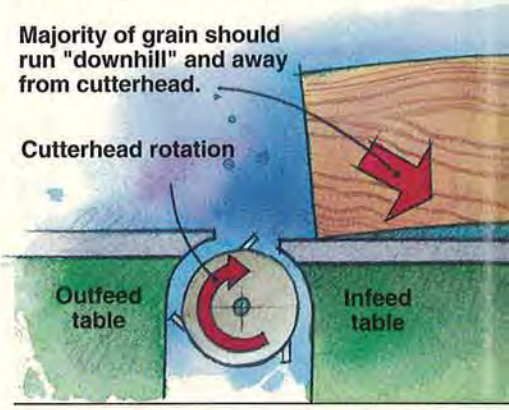


2 If you can't cut your board to shorter lengths, use this method to joint long, bowed stock. (We do not recommend that you try this procedure with workpieces longer than 6' if you have a 6" jointer, or longer than 8' if you own an 8" jointer. For these pieces, use the procedure described in Step 4.)

First, set your jointer for a 1/16" cut. Then, place your board on the jointer infeed table with its *concave edge down.* Make several passes on one end of the board. Each pass should remove more material along the edge than the pass before it. As the jointed surface of the edge approaches the center of the board, turn the board around and repeat this procedure on the other end. The jointed edges should nearly meet in the center. By this point the overall bow should be less than ⅛". Make one or two complete passes to straighten the edge.



3 Next, read the grain of the board to determine which end to feed first so the grain runs "downhill" and away from the cutterhead as shown *below.* This helps reduce grain tearout.

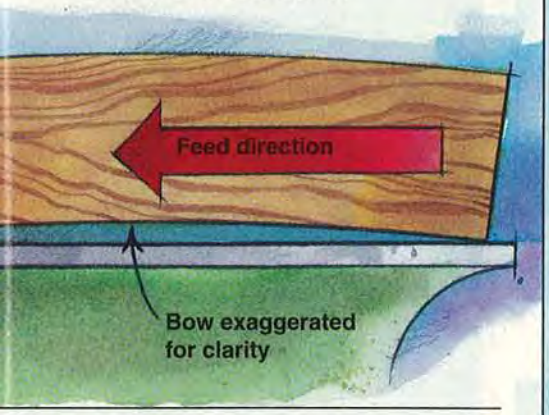


4 For boards too long for the method described in *Step 2*, or for short boards bowed ½" or more, try this technique. With a straightedge or chalk line, mark a line as shown *below.* Then, cut along this line with a portable circular saw or jigsaw. If you closely follow the line you should be able to joint the edge straight and smooth in one pass as described in *Step 3*.

Print this article

bowed stock

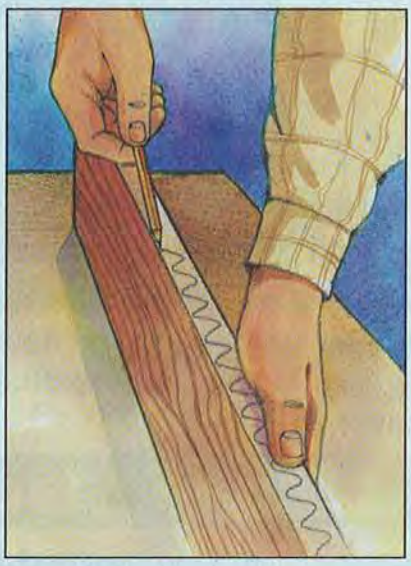
Now, decrease the cutting depth to 1/32" and make a final pass along the entire edge of the board. If the grain runs every which way, slow down your feed rate to reduce tearout to a minimum.



5 Because of the position of defects in a board, you may find it necessary to straighten its convex edge. This could happen when the best wood in a board is along its convex edge as shown *below*. Then, it often makes sense to straighten that edge first so you can join the good edge to other workpieces, or rip thin strips from the best wood and work toward the lesser-quality wood.

Do not attempt to straighten a convex edge on a jointer, even if the convex edge is bowed by less than ½". To straighten any convex edge, follow the method described in *Step 4*.

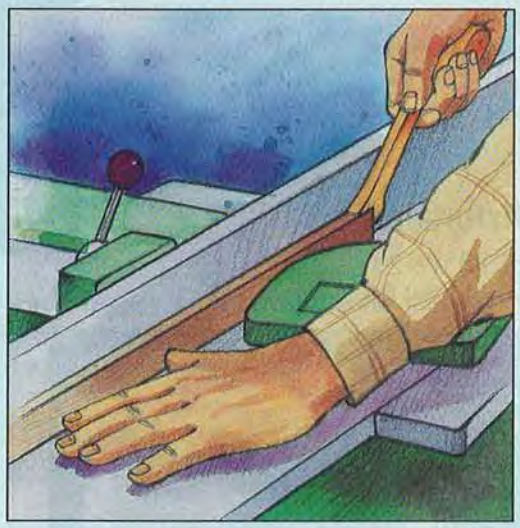
More jointing pointers to keep in mind



•The grain of highly figured woods such as bird's-eye maple can tear out quite easily, especially if your jointer knives aren't as sharp as they should be. At these times, slow down your feed rate to a crawl (just an inch or two per second) and take light cuts (1/32" or less).

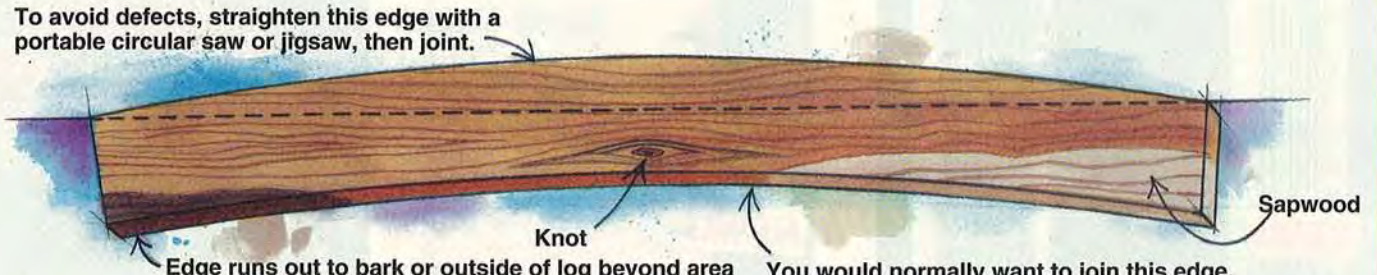
It may be difficult to tell if you're getting a complete cut at these shallow depths, so try this trick. Mark a wavy pencil line along the entire edge as shown *right*, and make the cut. Any remaining pencil marks tell you that you need to repeat the cut.

•Here's a good rule of thumb that may actually *save* your thumb. Whenever you edge-joint a board that is not as wide as your jointer's fence is high, use a pushstick as shown *right*



•Remember to reposition your jointer's fence across the width of the tables from time to time. You'll get more life from your knives because they will wear more evenly along their lengths.

Written by Bill Krier with Jan Svec
Illustrations: Brian Jensen


To avoid defects, straighten this edge with a portable circular saw or jigsaw, then joint.
Knot
Sapwood
Edge runs out to bark or outside of log beyond area that would be removed in straightening board.
You would normally want to join this edge, but these defects may dictate another course of action.

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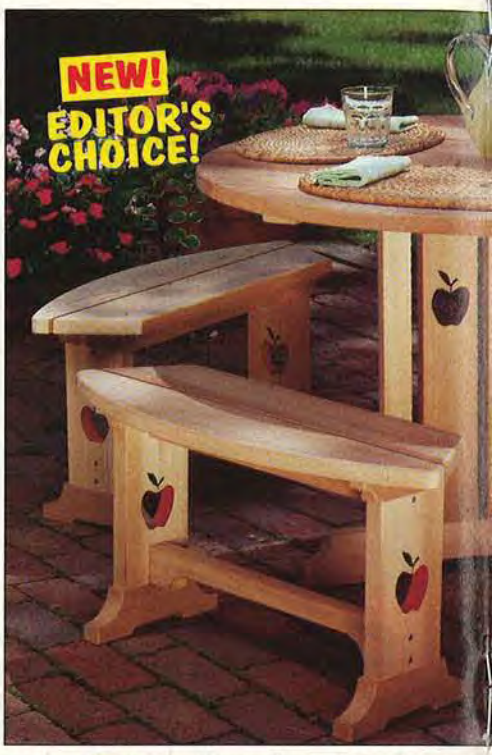

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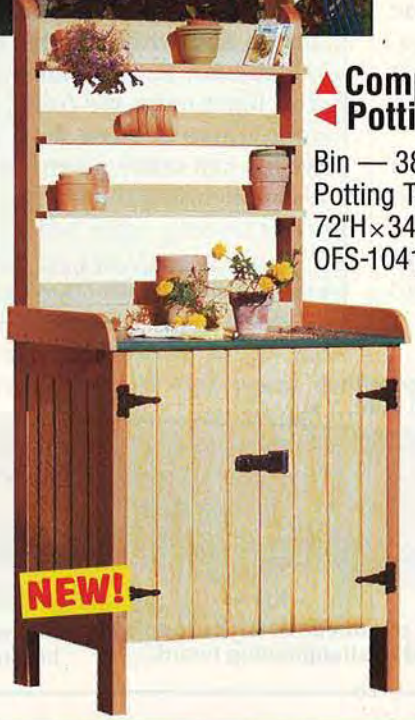

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GARDENER'S-DELIGHT

Potting Bench

Our thanks to reader Leroy Wagner of Glendale, Arizona, for this outdoor project idea. Simple construction, good looks, and lots of storage make this potting bench an ideal work center for creating a garden paradise right in your backyard.

***NOTE:** The joint dimensions specified in this project are based on the common milled dimensions of softwood lumber. If your lumber varies from the dimensions stated in the Bill of Materials, you'll need to adjust the size of the joints.*

Start with the 2x4 side frames

1 Cut the back legs (A), the front legs (B), and the rails (C) to the lengths listed in the Bill of Materials from 2×4 stock. Using the Back Leg and Side Frame drawings for reference, mark and then cut the half-lap joints and shelf dadoes on these pieces.

2 Mark and cut the 3½" radius on the top end of the back legs (A).

3 Glue and clamp parts A, B, and C in the configuration shown on the Side Frame drawing. (We used Titebond II, a weatherproof glue, to assemble all joints in this project.) Drill countersunk pilot holes, and drive screws to reinforce the half-lap joints.

Now, add the side panels

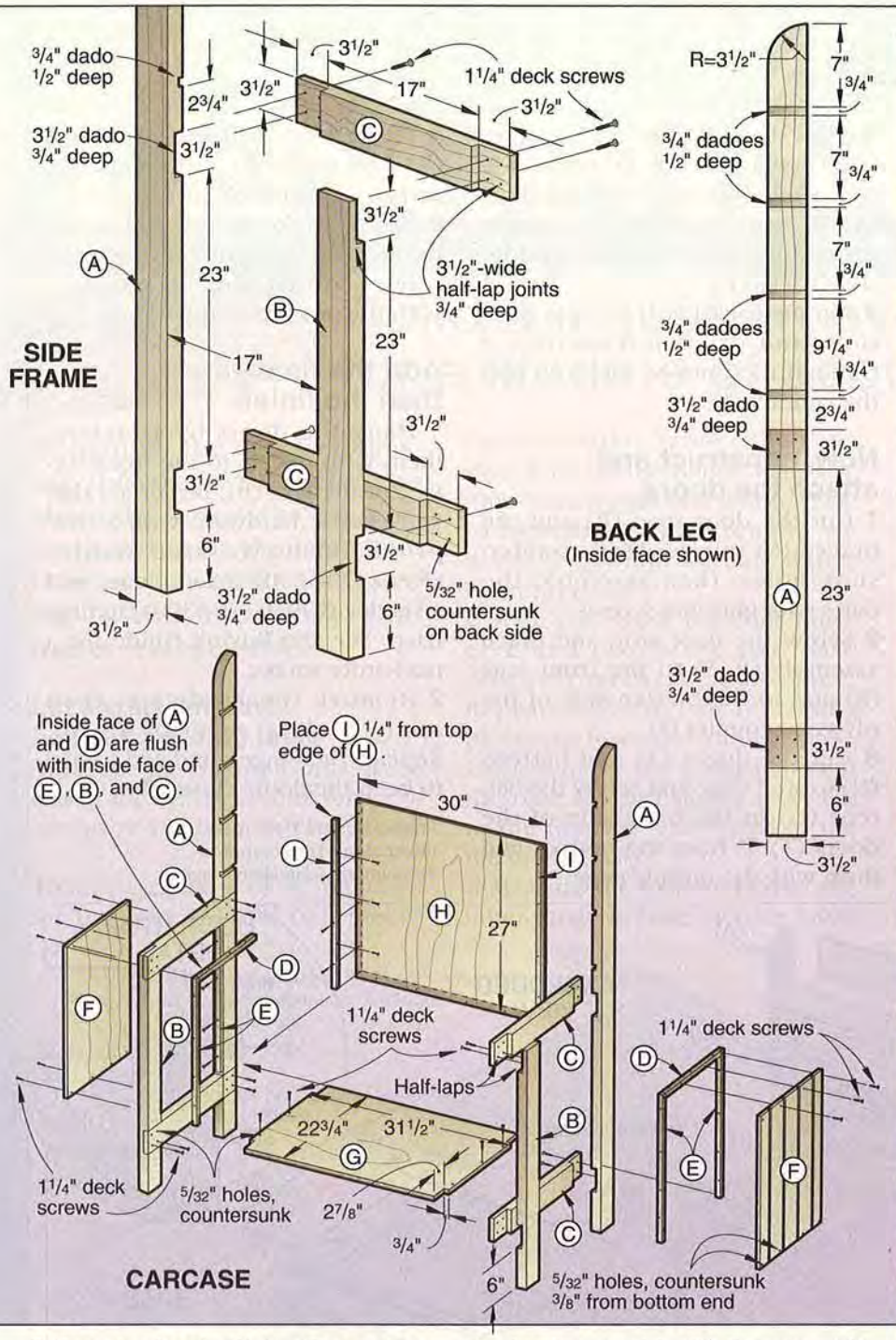
1 Rip and crosscut the top cleats (D) and the side cleats (E) to size. Glue and screw the cleats around the top and sides of the opening in the side frames.

2 Cut the side panels (F) from ⅝"-thick T-111 siding for a snug fit into the side frame assemblies. (T-111 is a rough-sawn exterior-grade plywood that features vertical grooves machined into its surface.) Plan your cuts so that the grooves in the siding are centered edge-to-edge in the side panels (F). Drill four countersunk 5/32" holes along the top and bottom edges of the side panels where shown on the Carcase drawing.

3 Place one side frame assembly on your workbench, with the outside facing up. Referring to the Carcase drawing, glue the side panel (F) into position, and drive screws through the holes along the top edge of the side panel (F) into the top cleat (D). Repeat this process with the other side frame assembly.

Next, make the bottom and back

1 Cut the bottom (G) and back (H) to size. Cut a notch in each corner of the bottom (G) where shown on the Carcase drawing. Next, drill and countersink 5/32" holes along the ends of the bottom (G).



Bill of Materials					
Part	Finished Size			Matl.	Qty.
	T	W	L		
SIDE FRAMES					
A back legs	1½"	3½"	72"	C	2
B front legs	1½"	3½"	36"	C	2
C rails	1½"	3½"	24"	C	4
D top cleats	¾"	¾"	15½"	C	2
E side cleats	¾"	¾"	22¼"	C	4
F side panels	⅝"	17"	23"	S	2
BOTTOM AND BACK					
G bottom	¾"	22¾"	31½"	EP	1
H back	⅝"	30"	27"	S	1
I back cleats	¾"	¾"	26"	C	2
COUNTER AND SHELVES					
J counter	¾"	23¾"	33"	EP	1
K counter sides	¾"	3½"	25"	C	2
L counter molding	¼"	¾"	33"	P	1
M top shelves	¾"	5½"	31"	C	3
N btm. shelf	¾"	2¾"	31"	C	1
O top & btm. shelf backs	¾"	5½"	30"	C	2
P middle shelf backs	¾"	3½"	30"	C	2
Q back splash	¾"	1¾"	30"	C	1
R door stop	¾"	2"	30"	C	1
S braces	¾"	2"	3"	C	2
DOORS					
T doors	⅝"	14⅞"	29¾"	S	2
U battens	¾"	3½"	14"	C	2
BOXES					
V backs	¾"	3½"	12½"	C	2
W ends	¾"	3½"	3¼"	C	4
X fronts	¾"	3½"	14"	C	2
Y bottoms	¾"	2½"	12½"	C	2

Materials Key: C–choice (cedar, redwood, cypress, or pressure-treated stock), S–siding (we used T-111 siding), EP-exterior plywood, P–pine or fir.

Supplies: 1¼" deck screws, 2½" deck screws, 2 pair of 4" tee hinges (Stanley SP909), 2×6" hasp (Stanley CD930), 1" brads, clear exterior finish.

Buying Guide

Hardware kit. 2 pair of 4" tee hinges with a black steel finish (Stanley SP909), 2×6" hasp with a steel black finish (Stanley CD930). $39.95 ppd. Miller Hardware Inc., 1300 M. L. King Jr. Parkway, Des Moines, IA 50314 or call 515-283-1724 to order.

2 Cut the back cleats (I) to size. Drill equally spaced mounting holes in adjacent surfaces of the back cleats where shown on the Carcase drawing. Then, glue and screw the cleats to the back.

3 Lay one side assembly (A–F) on the floor, with the inner surface facing upward. Glue and screw the bottom (G) in position. Next, glue and screw the back assembly (H, I) to the side assembly and bottom (G). Position the other side assembly, and fasten the bottom (G) and the back assembly (H, I) to it with glue and screws. Stand the assembly upright.

Build and attach the counter next

1 Cut the counter (J) to size. Next, cut notches in the back corners where shown on the Exploded View drawing. Test-fit the counter (J), noting that its rear edge is supported on the ends of the back cleats (I), making the front edge slightly lower for drainage.

Continued

Potting Bench

2 Cut the counter sides (K) to size and shape. Drill countersunk holes in the counter sides (K).
3 Cut the counter molding (L) to size, and attach it to the front edge of the counter (J). Set the brads slightly below the surface of the counter molding (L). If you want to paint the counter, now is the time to do it.
4 Set the counter assembly (J, L) into position, then attach the counter sides (K) to it and the back legs (A).

And now for the shelves

1 Cut the top shelves (M), bottom shelf (N), top/bottom shelf backs (O), middle shelf backs (P), and the backsplash (Q) to size.
2 Glue the shelves (M, N) into their dadoes in the back legs (A), and lightly clamp the back legs (A) to keep the joints snug.
3 Glue and screw the top shelf back (O) in place, attaching it to the top shelf (M) and the back legs (A). Glue and screw O to the bottom shelf (N) and the back legs (A). Repeat the drilling and gluing procedure to attach the middle shelf backs (P).
4 Slip the backsplash (Q) into position, and drive screws into it through the bottom shelf (N) and the counter (J).

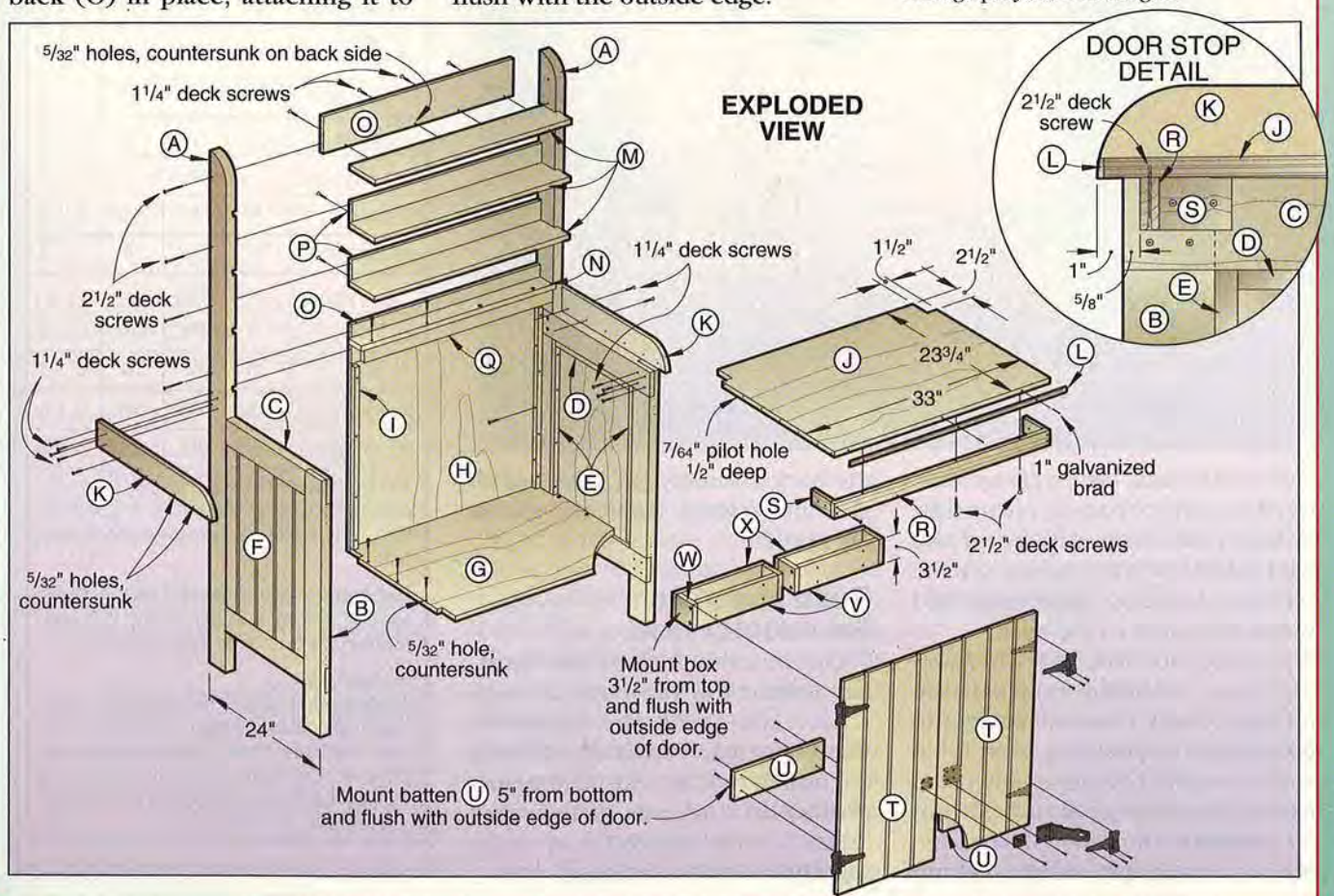
Now, construct and attach the doors

1 Cut the door stop (R) and the braces (S) to size. Drill countersunk holes, then assemble the parts with glue and screws.
2 Screw the door stop and brace assembly (R, S) to the front legs (B) and to the bottom side of the plywood counter (J).
3 Cut the doors (T) and battens (U) to size. Glue and screw the battens (U) to the back side of the doors (T) 5" from the bottom and flush with the outside edge.
4 Rip and crosscut the box backs (V), box ends (W), box fronts (X), and box bottoms (Y) to size.
5 Assemble the boxes, and screw them in place, positioning your screws so that they do not align with the grooves in the doors.

Add the hardware, then the finish

1 Hang the doors by attaching them with hinges to the front surface of the legs (B). Be certain that you choose hardware with a rust-proof finish. We used Stanley SP909 (78-5300) 4" tee hinges and a Stanley CD930 (75-5300) latching hasp. See the Buying Guide for a mail-order source.
2 Remove the hardware, then apply a clear exterior finish. Replace the hinges, and add a hasp to keep the doors closed.

Project Design: Dave Ashe
Illustrations: Lorna Johnson
Photograph: John Hetherington



ON-THE-MONEY TENONING JIG

A WOOD MAGAZINE EXCLUSIVE

Build it in just an evening or two for a lifetime of accurate results

Hopefully, the article following this one will excite you about the "strengths" of mortise-and-tenon joinery. And, this easy-to-make tablesaw jig is the accessory that makes it all possible.

Let's start with the base and sliding table

Note: *See the Buying Guide at the end of the article for our source of hardware and Baltic birch plywood.*

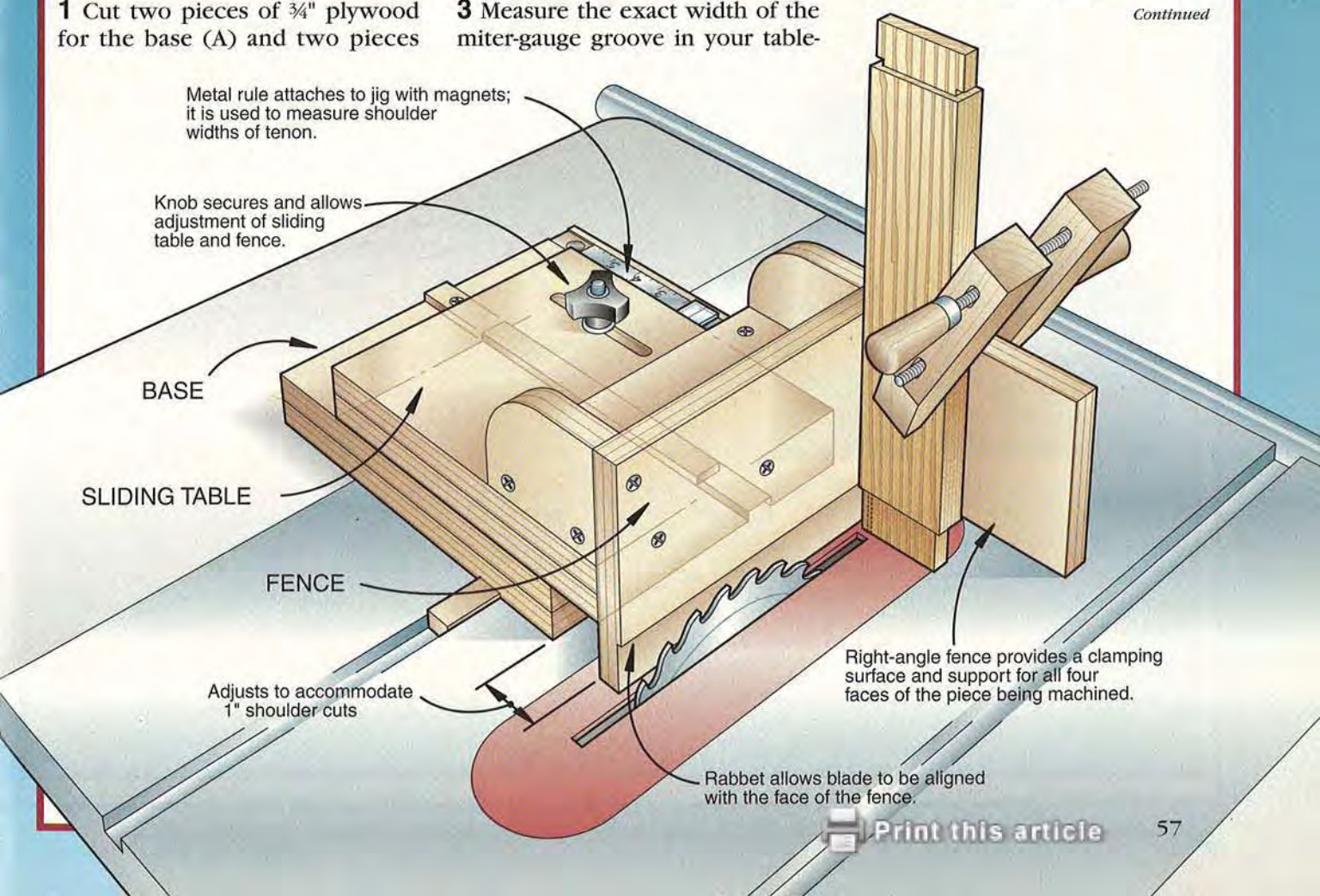
1 Cut two pieces of ¾" plywood for the base (A) and two pieces for the sliding table (B) to the sizes listed in the Bill of Materials, plus ½" in length and width. (Due to its stability and strength, we used ¾" [18mm actual] Baltic birch plywood.)

2 With the edges and ends flush, glue and clamp the two base pieces together face-to-face. Repeat with the two remaining pieces to form the sliding table. Later, remove the clamps and cut the base (A) and sliding table (B) to the finished sizes listed in the Bill of Materials.

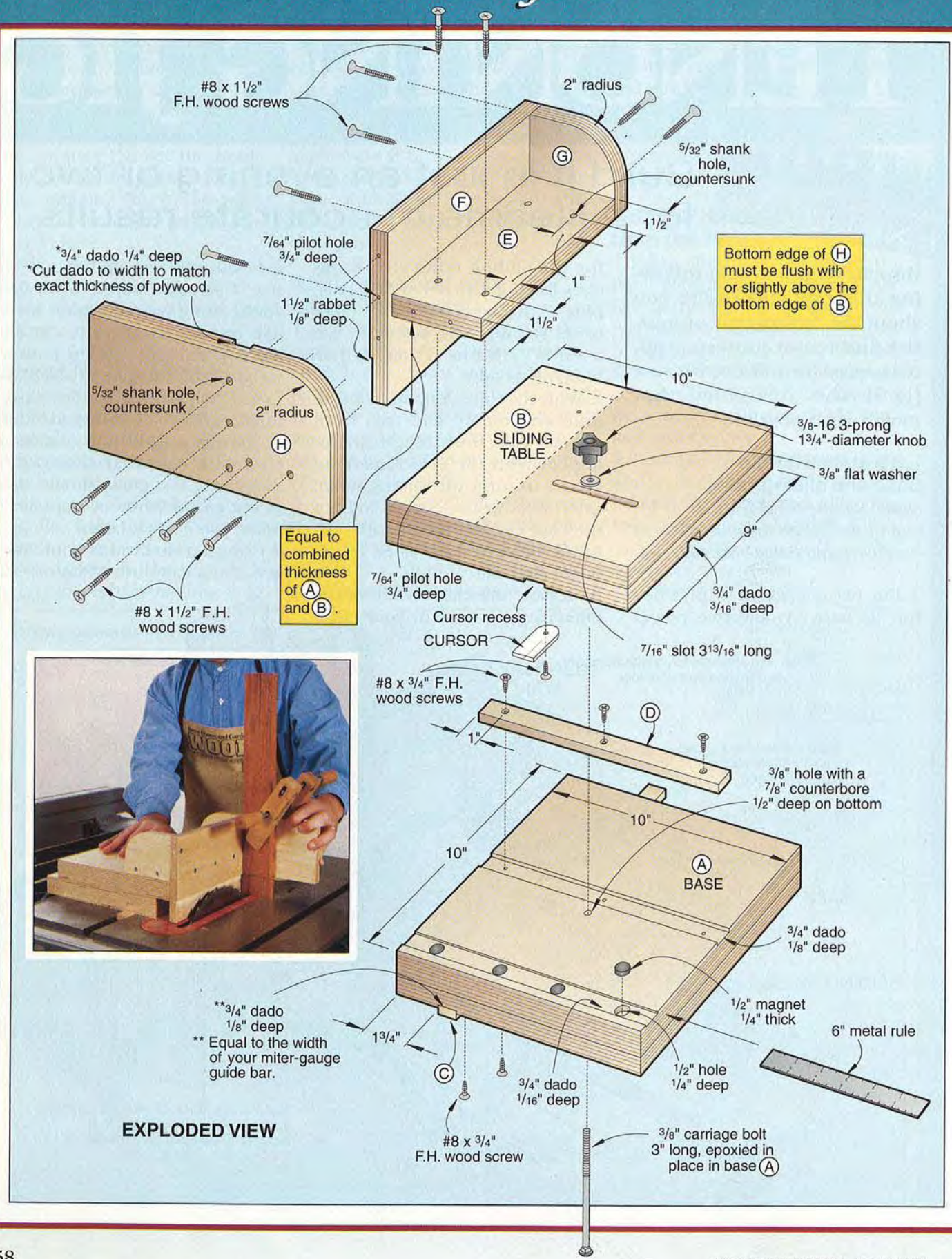
3 Measure the exact width of the miter-gauge groove in your tablesaw. Cut the base guide bar (C) to size. Use solid maple or birch if you're using your stock, or, if you use our hardware kit, cut the UHMW (ultra-high molecular weight) polyethylene to size. (We found polyethylene slides easier in the groove than wood. Plus, polyethylene will not change in size with seasonal changes in humidity.) The guide should slide in the groove without slop. Set it aside; you'll add it later.

4 Using a dado head in your tablesaw, cut a dado the width of your

Continued


Metal rule attaches to jig with magnets; it is used to measure shoulder widths of tenon.
Knob secures and allows adjustment of sliding table and fence.
BASE
SLIDING TABLE
FENCE
Adjusts to accommodate 1" shoulder cuts
Right-angle fence provides a clamping surface and support for all four faces of the piece being machined.
Rabbet allows blade to be aligned with the face of the fence.

TENONING JIG


#8 x 1 1/2" F.H. wood screws
2" radius
5/32" shank hole, countersunk
G
F
E
1 1/2"
1"
1 1/2"
7/64" pilot hole 3/4" deep
*3/4" dado 1/4" deep
*Cut dado to width to match exact thickness of plywood.
1 1/2" rabbet 1/8" deep
Bottom edge of H must be flush with or slightly above the bottom edge of B.
5/32" shank hole, countersunk
2" radius
H
10"
B SLIDING TABLE
3/8-16 3-prong 1 3/4"-diameter knob
3/8" flat washer
9"
Equal to combined thickness of A and B.
7/64" pilot hole 3/4" deep
3/4" dado 3/16" deep
#8 x 1 1/2" F.H. wood screws
Cursor recess
CURSOR
7/16" slot 3 13/16" long
#8 x 3/4" F.H. wood screws
D
1"
3/8" hole with a 7/8" counterbore 1/2" deep on bottom
10"
10"
A BASE
3/4" dado 1/8" deep
**3/4" dado 1/8" deep
** Equal to the width of your miter-gauge guide bar.
1/2" magnet 1/4" thick
6" metal rule
1 3/4"
C
3/4" dado 1/16" deep
1/2" hole 1/4" deep
#8 x 3/4" F.H. wood screw
3/8" carriage bolt 3" long, epoxied in place in base A
EXPLODED VIEW

guide bar (C) and ⅛" deep on the bottom side of the base (A) where dimensioned on the Exploded View and Parts View drawings. The guide bar (C) will fit into this dado later.

5 Cut a ¾" dado ⅛" deep on the top side of the base (A) and a mating ¾" dado 3/16" deep on the bottom side of the sliding table (B) where shown on the Parts View drawing. Later, you'll screw the guide bar (D) into the dado in the top of the base. And when assembled, the sliding table (B) will slide on the top, exposed portion of this guide bar.

6 Cut a ¾" dado 1/16" deep in the top of the base (A) to house the 6" metal rule. (See the Buying Guide for our source of the rule.)

7 Cut the second guide bar (D) so it fits snugly in the top dado in the base, and slides smoothly in the ¾" dado on the bottom of the sliding table. Set this guide aside also.

8 Mark the centerpoints where dimensioned on the Parts View drawing, and drill the holes for the magnets in the dado in the top of the base (A). Measure your magnets before drilling, they may vary in size. You want the magnets to sit just a hair below the surface of the dado.

9 Mark the centerpoint, and drill a ⅞" hole ½" deep on the bottom side of the base (A). Then, drill a

Continued

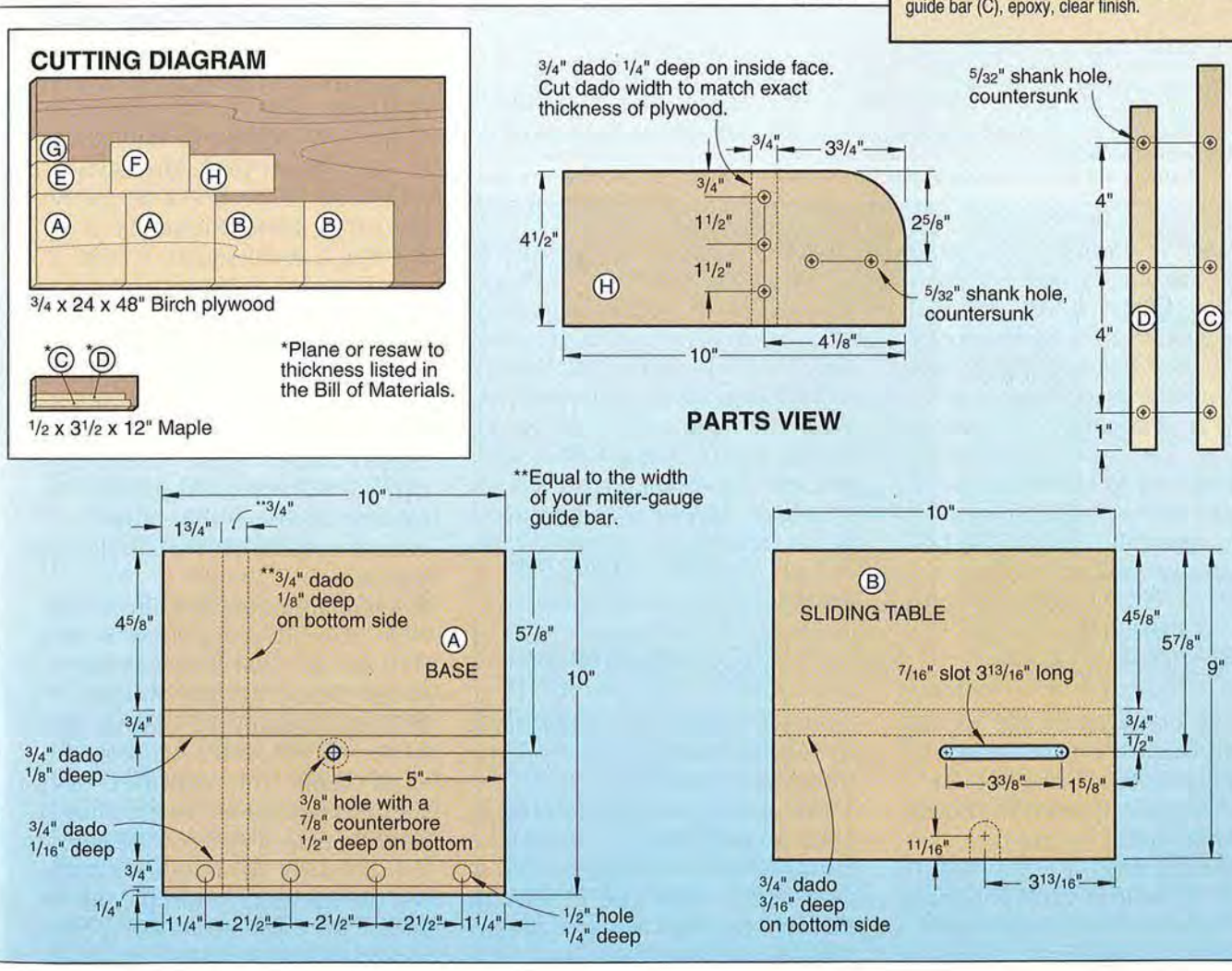
Bill of Materials

Part	Finished Size T	W	L	Matl.	Qty.
A* base	1½"	10"	10"	LBP	1
B* sliding table	1½"	9"	10"	LBP	1
C guide bar	7/16"	¾"	11"	M	1
D guide bar	5/16"	¾"	10"	M	1
E* horz. support	¾"	3¾"	8¼"	BP	1
F fence	¾"	6"	9¼"	BP	1
G radiused end	¾"	3"	3¾"	BP	1
H dadoed end	¾"	4½"	10"	BP	1

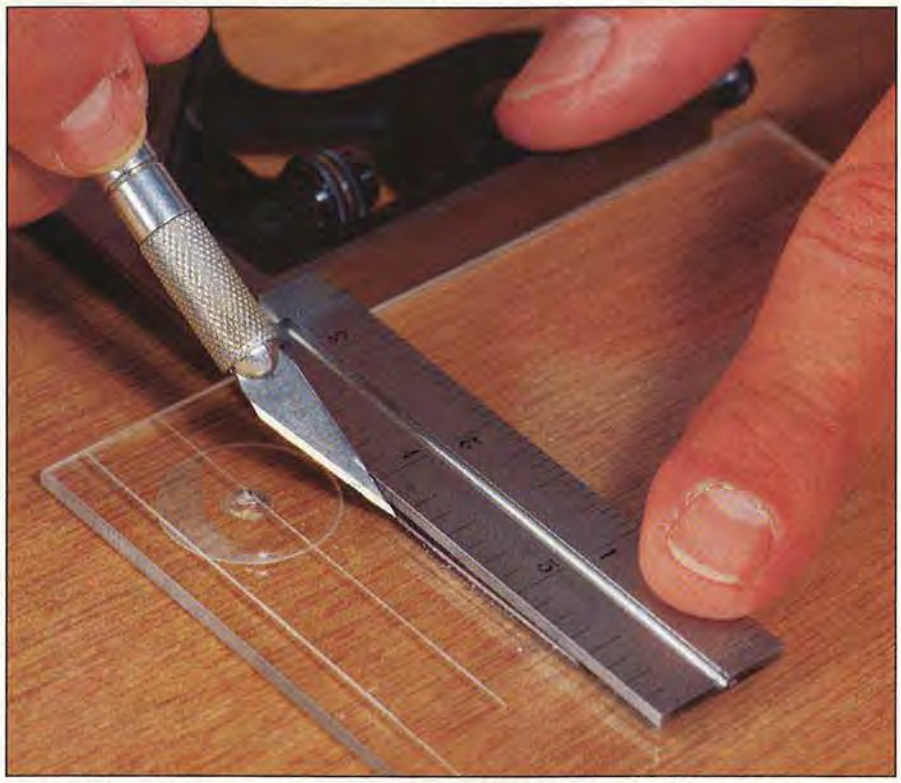
* Initially cut parts oversized. Trim to finished size according to the how-to instructions.

Materials Key: LBP–laminated Baltic birch plywood, BP–Baltic birch plywood, M–maple

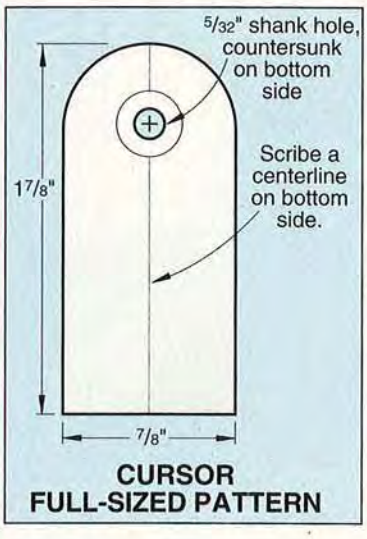
Supplies: 7–#8x¾" flathead wood screws, 15–#8x1½" flathead wood screws, 4–½" magnets ¼" thick, 6" metal rule, ⅜" carriage bolt 3" long with mating washer and plastic knob, ⅛x4x4" acrylic for cursor, UHMW polyethylene for the guide bar (C), epoxy, clear finish.

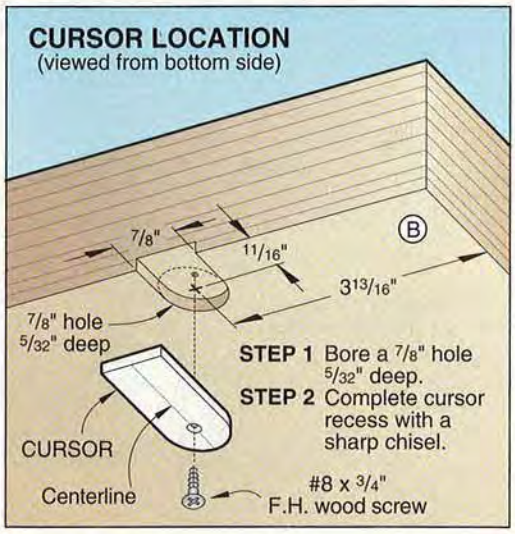


TENONING JIG



Drag the blade of an X-acto knife sideways to scribe the centerline and cutlines on the acrylic cursor blank.



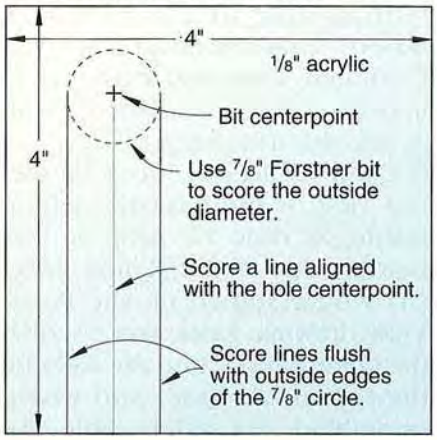


3/8" hole centered in the 7/8" hole and through the base for the 3/8" carriage bolt. Check the fit to make sure the bottom of the carriage bolt doesn't protrude.

10 Mark a pair of centerpoints, drill a 7/16" hole at each point, and cut between the holes with a scrollsaw or jigsaw to form the 7/16"-wide slot in the sliding table (B) where dimensioned on the Parts View drawing.

11 Drill countersunk mounting holes in the guides (C, D) where dimensioned on the Parts View drawing. Screw the guides in place, making sure the screw heads don't protrude.

FORMING THE CURSOR


4"
1/8" acrylic
Bit centerpoint
4"
Use 7/8" Forstner bit to score the outside diameter.
Score a line aligned with the hole centerpoint.
Score lines flush with outside edges of the 7/8" circle.

Form the cursor next

1 Cut a piece of 1/8" clear acrylic to 4×4". Chuck a 7/8" Forstner bit into your drill press, and position the bit over the acrylic roughly where shown on the drawing *above*. Clamp the acrylic securely to your drill-press table.

2 Start the drill press, and slowly lower the bit until the outside edge and centerpoint of the bit just barely scores the acrylic.

3 Using a small square and an X-acto knife held *sideways* (it scores better this way), score the three lines on the *bottom side* of the acrylic where shown on the drawing *above* and in the photo *at left*.

4 To make the centerline on the cursor more visible, use a felt-tipped marker to highlight the middle scribed line. Wipe any excess marker off the surface of the cursor.

5 Using your bandsaw fitted with a 1/8" blade or a scrollsaw with a #10 blade, cut the cursor to shape. Sand the edges smooth.

6 Working from the bottom side of the cursor, drill a 5/32" countersunk shank hole centered over the bit centerpoint where shown on the Cursor Full-Sized Pattern.

7 Using the Cursor Location drawing for reference, form the cursor recess on the bottom side of the sliding table (B).

Add the workpiece support

Note: *Plywoods vary in thickness. All dimensions are based on plywood measuring exactly ¾" thick. See the tinted boxes on the Exploded View drawing before locating the horizontal support (E) against the fence (F).*

1 Cut the horizontal support (E) to size plus ½" in length. Then, cut the fence (F), radiused end (G), and dadoed end (H) to size.

2 Cut the rabbet along the outside face of the fence (F) where shown on the Exploded View drawing.

3 Cut a ¼"-deep dado in the inside face of H to the same exact thickness as your plywood.

4 Mark the centerpoints, and drill holes in H where dimensioned on the Parts View drawing. Clamp the end (H) to the fence (F) and drive the screws. Drill the holes, and screw the opposite end (G) to the fence. Measure the distance between the ends (G, H), and cut the horizontal support (E) to final length and screw it in place, making sure parts G and H meet at right angles to part E.

5 Clamp the support (E, F, G, H) to the sliding table (B), and screw the two assemblies together, keeping the outside face of F square to the sliding table.

Finishing and final assembly

1 Finish-sand all the pieces and seal with polyurethane.

2 Cut a piece of wood to ¾×11/16×12". Then, put a drop of epoxy in each magnet hole, fit the magnets into the holes, and wipe off any excess epoxy. As shown in the photo *above right*, position the strip of wood over the magnets, and use it as a clamping bar to hold the magnets in place until the epoxy cures. Later, remove the clamping block and clamps.

3 Screw the acrylic cursor in place in the recess on the bottom of the sliding table (B).

Use a strip of wood, a pair of clamps, and waxed paper to hold the magnets in place until the epoxy cures.

4 Position the sliding table (B) on the base (A). Slide a ⅜" carriage bolt through the ⅜" hole in the base (A) and through the 7/16" slot in the sliding table (B). Slide the two assemblies back and forth to check the fit, then epoxy the carriage bolt in place. Attach a washer and plastic knob onto the bolt where shown on the Exploded View drawing. To prevent the jig from possibly rocking on the saw table, make sure that the bottom edge of the fence (F) is flush with the bottom surface of the base (A). If F is higher, you may encounter a bit of rocking when the sliding table/fence is slid away from the base when cutting tenons. This can result in poorly cut tenons.

5 Lay the metal 6" rule in place on the magnets in the shallow dado. See the following article for positioning the rule in relation to the fence.

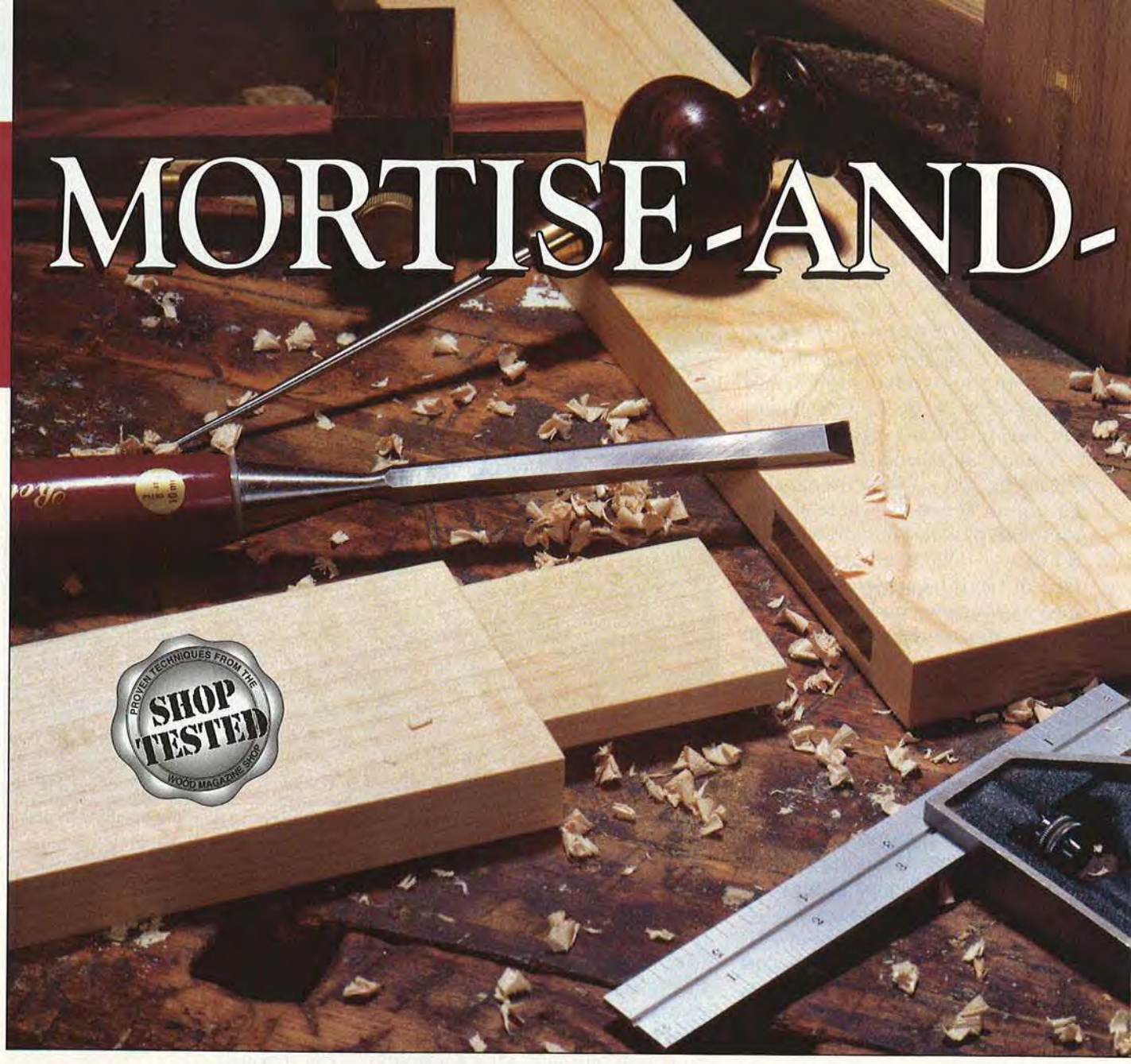
Buying Guide

Hardware kit. All the hardware listed in the Supplies listing at the end of the Bill of Materials except for the finish and epoxy. WOOD KIT™ TENJ1, $27.95 plus $3.75 shipping. Schlabaugh and Sons Woodworking, 720 14th Street, Kalona, IA 52247 or call 800/346-9663 to order.

Hardware and precut wood kit. All the pieces listed in the hardware kit, plus all the Baltic birch plywood and maple pieces listed in the Bill of Materials cut to size and shape (but not predrilled). WOOD KIT™ TENJ2, $94.50 plus $12 shipping. Address and phone *at left*.

Written by Marlen Kemmet Project Design: James R. Downing Illustrations: Roxanne LeMoine Photographs: John Hetherington

MORTISE-AND-



If you've shied away from mortise-and-tenon joinery because it sounds too complicated, take heart. With our tenoning jig and a little practice, you can turn out tight-fitting joints like a professional craftsman.

Editor's Note:
According to woodworking tradition, you cut a mortise first and fit the tenon to it. The technique yields tight-fitting joints, but requires painstaking trial-and-error trimming. Determined to find an easier way, WOOD® magazine's Design Editor Jim Downing developed a new tenoning jig, detailed on page 57, *and a technique that stands tradition on its head.*

What makes a mortise-and-tenon joint so strong?

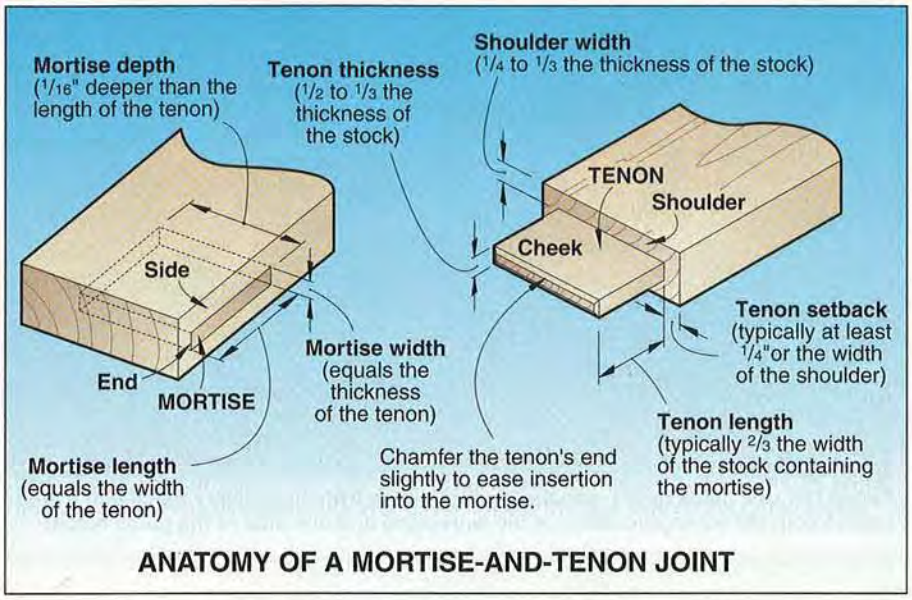
Check out the construction of a sturdy chair or table sometime, and you'll probably find that it was built with mortise-and-tenon joints. When it comes to strength, few woodworking joints match the mortise-and-tenon. That's why this old standby shows up so often in leg-and-rail construction and other adaptations that subject a joint to stress from several directions at the same time.

Study the typical mortise-and-tenon joint shown in the Anatomy of a Mortise-and-Tenon Joint drawing *top right*, and you'll notice that the largest mating surfaces contain face grain. When glued together, these face-grain-to-face-grain areas create exceptionally strong bonds. This gives the joint much greater strength than a butt joint, in which one of the mating surfaces contains only end grain. Proper proportions keep both the tenon and mortise strong.

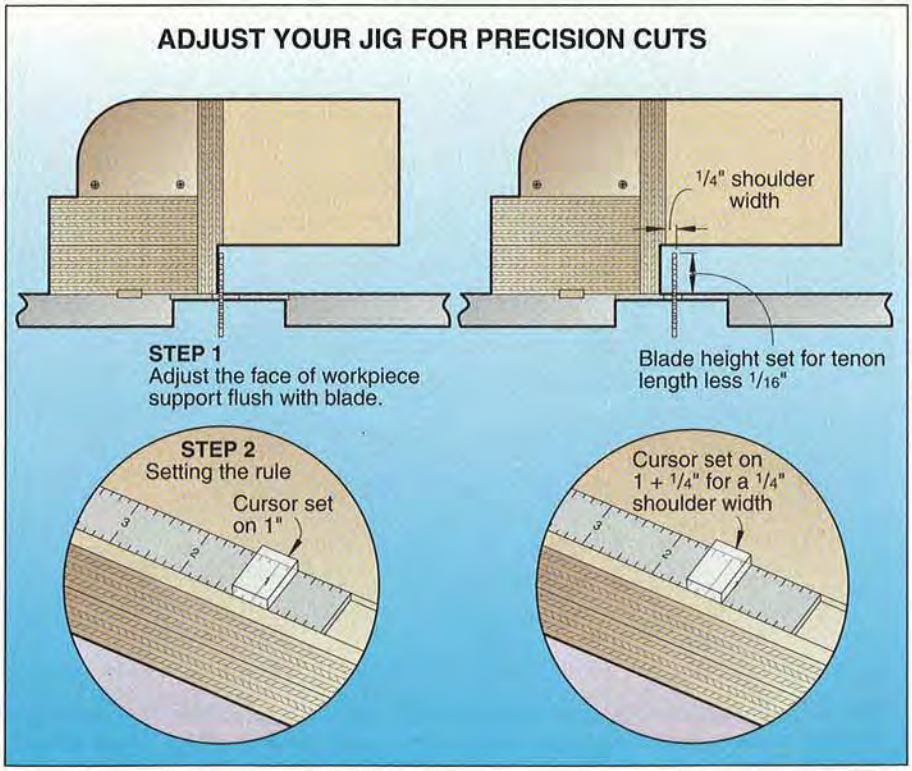
Print this article

TENON JOINERY

Our jig guarantees your success


Mortise depth
(1/16" deeper than the length of the tenon)
Tenon thickness
(1/2 to 1/3 the thickness of the stock)
Shoulder width
(1/4 to 1/3 the thickness of the stock)
TENON
Shoulder
Cheek
Side
End
MORTISE
Mortise width
(equals the thickness of the tenon)
Tenon setback
(typically at least 1/4"or the width of the shoulder)
Tenon length
(typically 2/3 the width of the stock containing the mortise)
Mortise length
(equals the width of the tenon)
Chamfer the tenon's end slightly to ease insertion into the mortise.

ANATOMY OF A MORTISE-AND-TENON JOINT


ADJUST YOUR JIG FOR PRECISION CUTS
1/4" shoulder width
STEP 1
Adjust the face of workpiece support flush with blade.
Blade height set for tenon length less 1/16"
STEP 2
Setting the rule
Cursor set on 1"
Cursor set on 1 + 1/4" for a 1/4" shoulder width

How to build and adjust the "On-the-Money Tenoning Jig"

As mentioned in the Editor's Note, our tenoning jig is the key to cutting professional-looking joints. So turn to *page 57*, and build the jig. When you've completed it, return here and read on.

To adjust your jig for precision cuts, start by placing the tenoning jig on your tablesaw, with the bar in the miter-gauge slot. Loosen the knob on the sliding table and position it so the fence clears the saw blade. Raise the blade to 1", then move the sliding table so the face of the fence aligns flush with the outside edge of the blade, as shown in the Adjust Your Jig for Precision Cuts drawing, *left*. Tighten the knob to hold the sliding table in place.

With the blade properly aligned with the fence, slide the jig's built-in steel rule until the cursor lines up directly over the 1" mark, as shown in Step 2. (Using the 1" mark provides more accuracy than trying to align the mark on the "zero" end of the rule.)

Now, loosen the knob on the sliding table, and adjust the cursor along the rule to make the desired shoulder width, as shown in the drawing at *left*. Our example

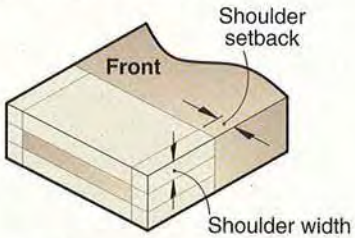
Continued

shows the setting for a ¼" cut, but for other widths, adjust the cursor the appropriate distance from the 1" mark on the scale.

How to make flush mortise-and-tenon joints

When Design Editor Jim Downing developed the "On-the-Money Tenoning Jig," he also was looking for a simpler way to create tight-fitting mortise-and-tenon joints. Rather than the traditional method of cutting the mortise first and fitting the tenon to it, Jim decided to use the precision-cut tenons produced with the tenoning jig to accurately lay out the matching mortises.

Jim's technique, described here, uses a guide-block to aid in both the mortise layout and cutting processes. Cut using the same jig settings as the tenon, the guide-block ensures accurate placement of the mortise. It also keeps your chisel aligned vertically when you square up the mortise.



LAYING OUT A TENON

Note: Before you start cutting, choose and mark the best side of your workpieces. Use these reference marks when laying out your mortises and tenons so the best sides get the exposure.

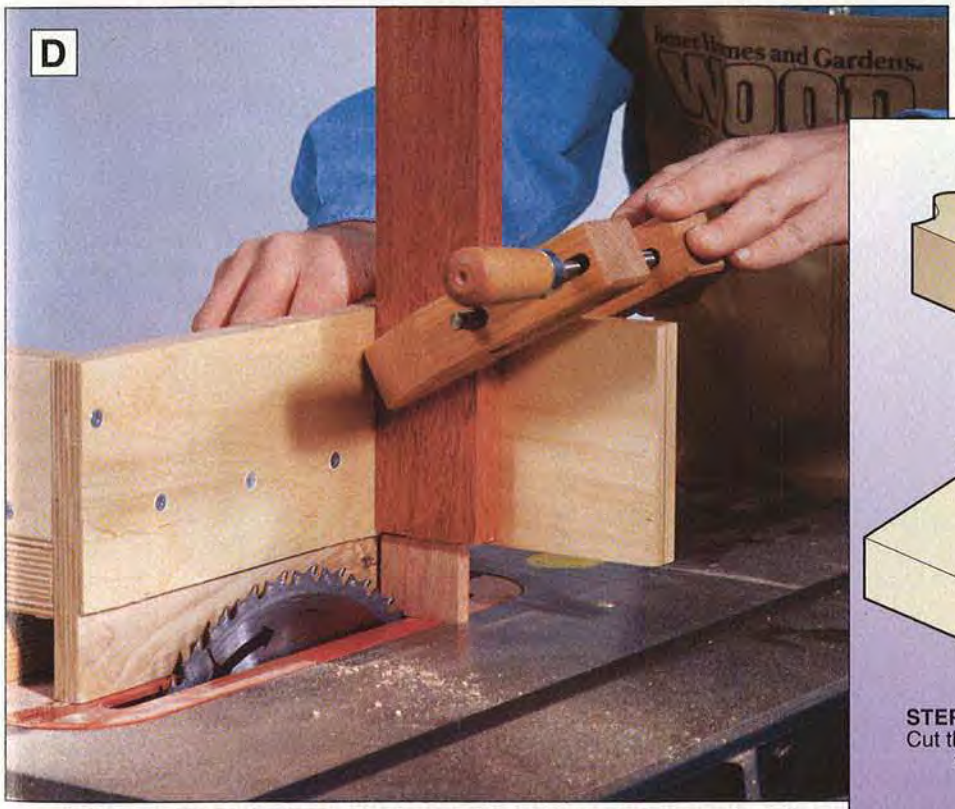
Tips on tackling the tenon

Begin by laying out the tenon as shown in the Laying Out a Tenon drawing, *above*. A combination square, and a sharp pencil or scratch awl work great for transferring marks to all four sides. For our sample project, we made the tenon 1" long, with ½" setbacks and ¼" shoulders.

Adjust the saw blade depth, and use a miter gauge with an auxiliary fence and a stop-block to cut the tenon shoulders in the workpiece and one side of the guide block.

Turn the workpiece on edge, butt it against the stopblock, and cut the tenon setback shoulder. Rotate the piece 180° and cut the other setback shoulder.

With the jig cursor set at 1¼" (for a ¼" cut), clamp the board against the jig fence, and cut the tenon cheeks in your workpiece and in the one side of the guide block.



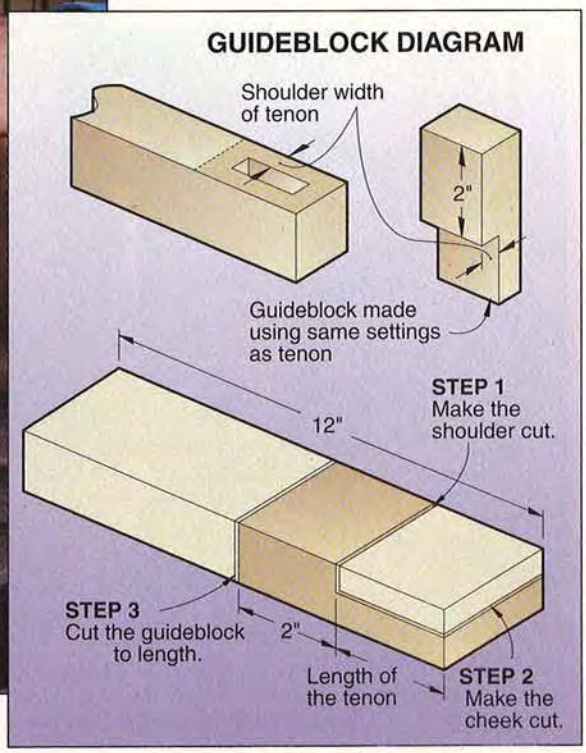
Adjust the jig to the proper setback, clamp the workpiece against the jig's dadoed end, and cut the tenon setbacks.

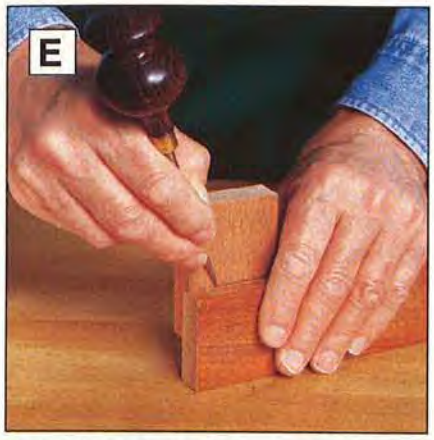
Next, cut the shoulders. Using a miter gauge with an auxiliary fence, align the shoulder of the tenon with the saw blade. Attach a stopblock to the auxiliary fence to duplicate the cuts.

Lay the workpiece flat on the saw table, and adjust the height of the blade so it just touches the marked edge of the tenon cheek. Cut the shoulders on both sides of the tenon, as shown in *photo A*. Using a 12"-long piece of scrapwood the same thickness and width as your workpiece, make a shoulder cut ***in one side only*** (see the Guideblock Diagram, *below*). Set this piece aside for the guideblock. Align the tenon end with the stopblock, and cut the two setback shoulders as shown in *photo B*.

And now for the tenon cheeks. With the tenoning jig set for a ¼"-wide cut, raise the blade to 15⁄16". Secure the workpiece as shown in *photo C*, turn on the tablesaw, and push the workpiece through the blade. Rotate the workpiece 180°, clamp it down,

Continued





Hold the guideblock firmly on the piece to be mortised, and mark the location of the mortise sides with a sharp pencil.

and cut the second cheek. Without changing the jig setup, make one cheek cut in the guideblock piece, then set it aside.

Finish up with the tenon setbacks. Set the jig to make a ½"-wide cut, clamp the workpiece in the jig as shown in *photo D*, and cut the setback. Rotate the workpiece 180°, and cut the second tenon setback.

Finally, crosscut the scrapwood guide block to finished length, making it 2" longer than the length of the tenon cut (see the Guideblock Diagram, *on the previous page*).

Now for the matching mortise

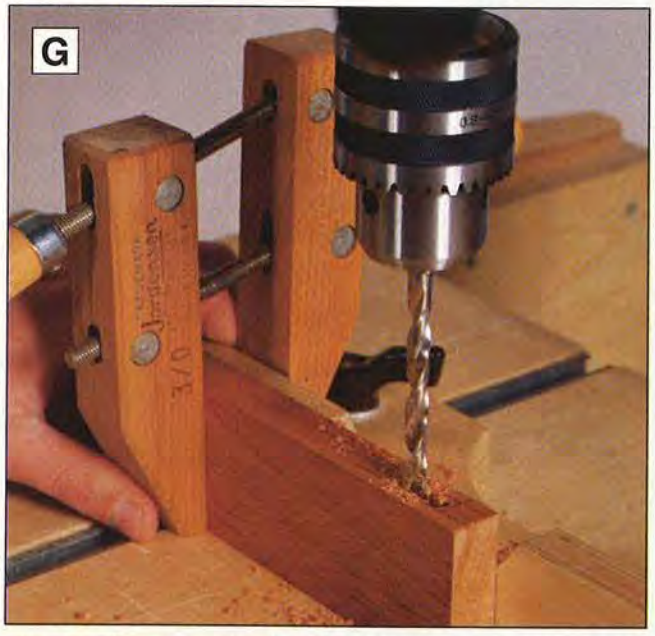
To lay out the mortise, position the guideblock on the piece to be mortised, then mark the side of the mortise as shown in *photo E*. Then, place the guideblock on the other side of the workpiece and mark the opposite mortise side.

Using the tenon as a guide, mark the proper length of the mortise as shown in *photo F*. Be sure to keep the edge of the tenoned board flush with the end of the mortise piece.

To rough out the mortise, clamp the workpiece in a drill press, and using a brad-point bit

Position the tenon atop the piece to be mortised, and mark the mortise ends. Be sure to keep the two workpieces flush and square.

Clamp the guide block to the workpiece. Keep the flat side of a wide chisel held firmly against the block, and shear the excess wood from the sides of the mortise.



Using a bit 1/16" smaller than the mortise width, drill a series of holes the length of the mortise. Drill the end holes first and make all holes 1/16" deeper than the length of the tenon.

Sand slight chamfers on the end of the tenon to make it easier to insert the tenon in the mortise. Dry-fit the mating joint pieces and sand the tenon faces or chisel the mortise as necessary.

1/16" smaller in diameter than the width of the mortise, drill a series holes the length of the mortise as shown in *photo G*. The holes should just touch or have a small gap between them to avoid drill bit deflection and poor alignment. The holes should be 1 1/16" deep, or 1/16" deeper than the length of the tenon.

To square-up the mortise, clamp the guideblock in position on the mortised piece, and hold your chisel flat against the block as shown in *photo H*. The guideblock keeps the chisel vertical as you shear away the waste from the sides of the mortise. Use a chisel the same width as the mortise to square up the ends.

Final fitting, gluing, cleanup

Before you try fitting the joint together, sand slight chamfers on the end of the tenon as shown in *photo I*. This lets you fit the tenon into the mortise more easily.

Test-fit the mating workpieces before applying glue, and sand the tenon or chisel the mortise as necessary. Apply glue to all faces of both sides of the joint as well as the tenon shoulders, then clamp the workpieces together. Use a putty knife or chisel to scrape off any glue squeeze-out after a tough skin forms.

Despite the jig's accuracy, the faces of the mating pieces may not always align perfectly flush. To get them flush, we prefer to use a random-orbit sander to avoid cross-grain scratches.

Variations for added strength

The flush joint we just showed you works well in many applications, but you can make the joint even stronger. By adjusting the tenon's placement, you can strengthen the corresponding mortise. These adaptations work well in leg-rail construction.

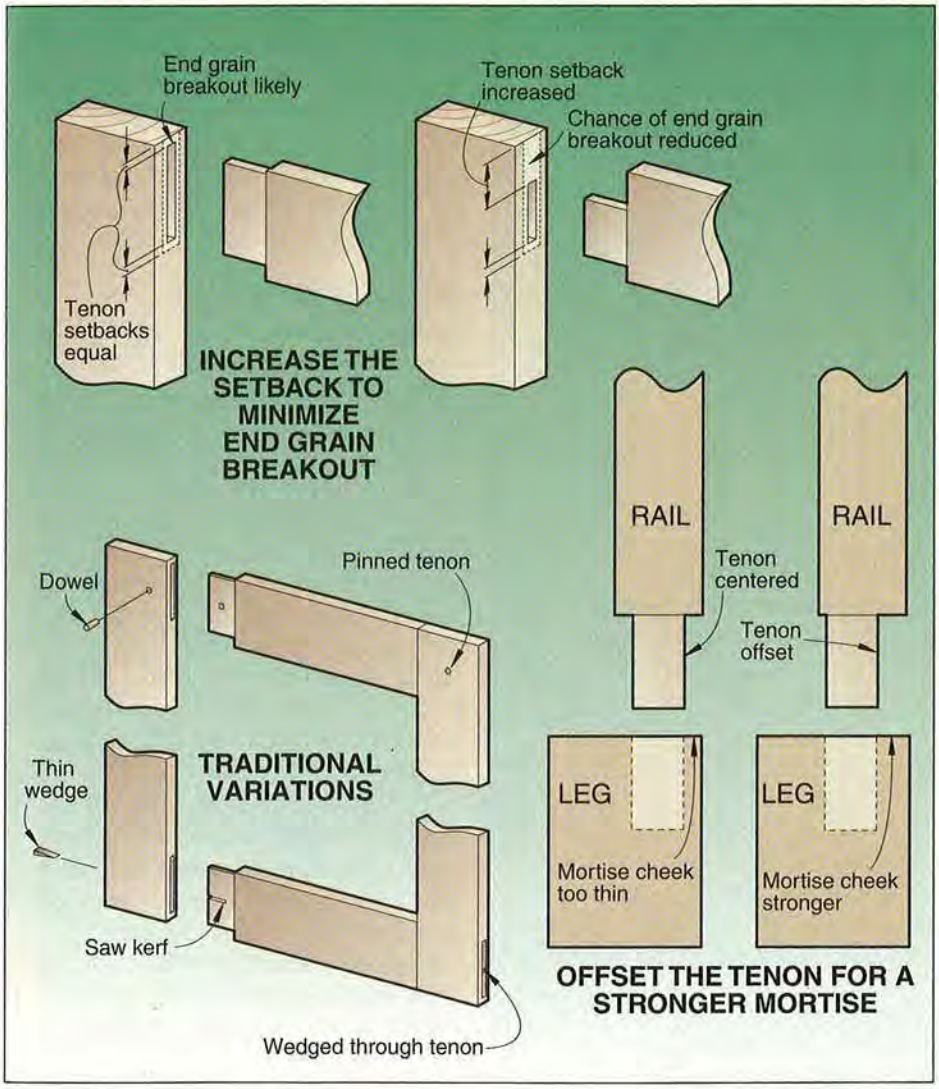
By shifting the tenon setback (see the drawing at *top left*), you cut the mortise farther away from the end of the leg, reducing the chance for endgrain breakout.

In some situations, the rail fits flush with the front face of the leg. If the tenon were centered, the outside mortise wall would be thin and weak. But by offsetting the tenon, you can keep the rail flush with the leg without weakening the tenon or the mortise wall (see drawing at *lower right*).

Early craftsmen used a variety of methods to reinforce mortise-and-tenon joints. While today's glues will hold joints tight, using pins or wedges, as illustrated in the drawing at *lower left*, still bolsters strength while lending an old-world touch to your project.

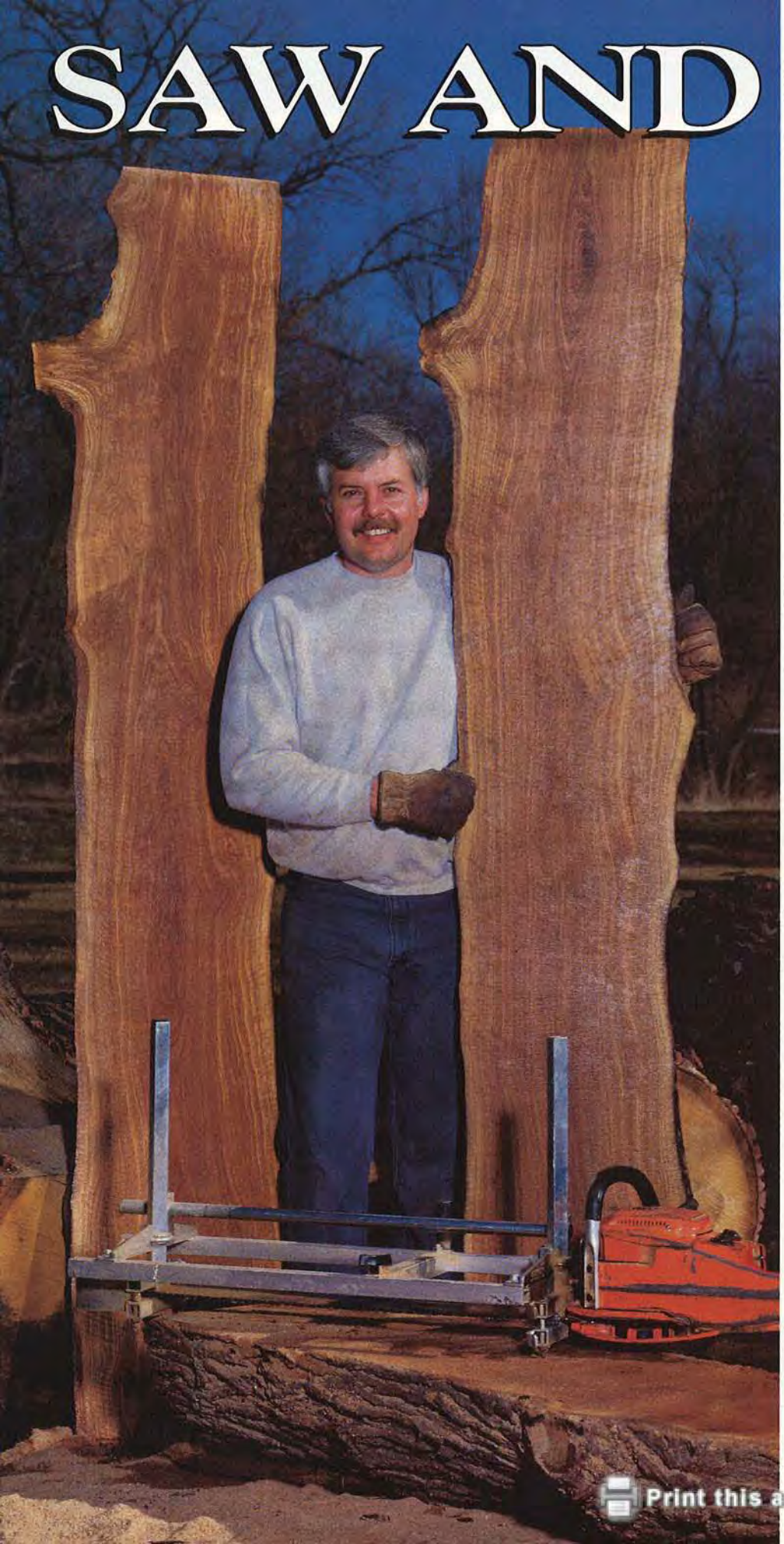
To pin a tenon, first assemble the mortise-and-tenon joint. When the glue dries, drill a centered hole completely through the joint. Apply glue to the dowel and tap it into place, saw off the excess, and sand it flush.

In a through-tenon joint, the tenon extends completely through the mortised workpiece. A wedge driven into the end of the tenon effectively locks it in place. To wedge a through tenon, cut a saw kerf into the end of the tenon, about three-quarters of its length. Glue and assemble the joint, then apply glue to a thin wedge and drive the wedge into the saw kerf. When the glue dries, saw off the excess tenon and sand it flush.



Written by Kerry Gibson with Jim Downing Photographs: John Hetherington Illustrations: Roxanne LeMoine

SAW AND SAVE



If you spend a lot of money on lumber, and would like to slash your costs big-time, have I got a deal for you. I produce thousands of board feet of prime oak, walnut, and cherry stock for pennies per board foot. And you can, too! Here's how.

Dave Henderson
Contributing Editor

Like any devoted woodworker and husband, I was more than willing to accommodate my wife Becky's request for a new Mission-style bed. So, after some careful planning, I went to my local hardwood supplier and bought the necessary oak—about $300 worth. And after Becky saw how nicely the bed turned out, she came up with a list of about a dozen other furniture pieces needed for our home.

Studying the options

Although I cheerfully agreed to undertake every project on the list, I knew I had to come up with a more affordable means of acquiring lumber. So, I checked out these alternatives:

• ***Harvest my own wood and haul the logs to a sawmill.*** I've always been able to get my hands on good-quality logs (see the article on *page 98* for tips on doing this). But, hauling the log to the mill was a lot of work, and gave me little control over the finished product. The mill charged 40 cents a board foot for cutting the log into boards, and would accept only logs from forested property for fear of striking embedded metal and damaging a blade.

• ***Buy my own sawmill.*** It didn't take long to decide that I couldn't afford a trailer-based bandsaw or circular-saw mill, both of which start at around $6,000. These

Print this article

by milling your own lumber

make sense if you mill large numbers of logs, or go into business sawing logs for other people, but that's not what I had in mind.

• ***Buy a handheld portable mill.*** These come in two forms: a bandsaw mill powered by a chainsaw engine, or a metal frame that guides a chainsaw. Both types save you the work of moving the log because you cut it right where it falls. I tried a bandsaw model, and liked its performance, but the price (about $1,400 without engine up to $2,000 with engine) was too steep for me.

Then, I tried and settled on the Alaskan MK III Saw Mill Attachment for a chainsaw from Granberg International (for address see the Buying Guide at the end of this article). The 36" model I use (24"-, 30"-, 48"-, and 56"-long models are also available) consists of a 10-pound, H-shaped metal frame that clamps to the saw bar. Combined with my 33" saw bar, this setup gives me 26½" of cutting capacity.

I power my mill with a Husqvarna 285CD that I purchased at a garage sale for $100. The saw engine displaces 5.2 cubic inches and produces 5.5 horsepower—about the right amount of cutting power for the 33" saw bar.

My costs besides the chainsaw included $189 for the MK III, $30 for repair parts for the used chainsaw, $80 for the 33" chainsaw bar, $40 for sharpening tools, and $40 for a special ripping chain (a standard crosscut chain works, but not nearly as efficiently). Including other miscellaneous items, my total investment was less than $500. A similar setup with a new chainsaw would cost around $1,000.

How a chainsaw mill works

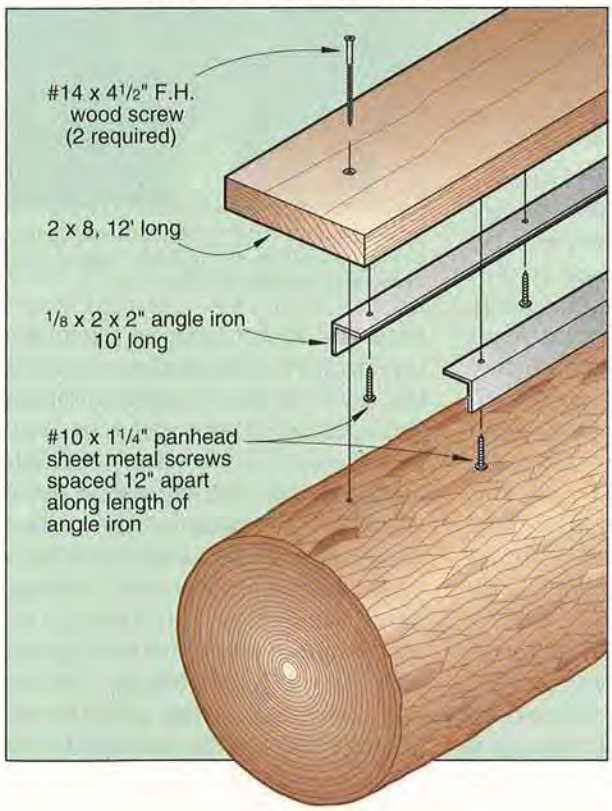
To prepare a log for the mill, I first cut it into 8' or 10' lengths—whatever makes the best use of the log. Then, I trim off any limbs or burls to make the log as cylindrical as possible.

It takes me about 10 minutes to attach the chainsaw to the MK III frame. Then, I secure a 12'-long 2×8 fir board to the top of the log with two 4½" screws. The 2×8 stays stiff, flat, and straight thanks to a pair of 10'-long, ⅛×2×2" steel angle irons that I mounted along the edges on one face of the board (see the drawing *below left*). I secured the angle irons with countersunk 1¼" screws spaced 12" apart. The irons go against the bark and help cradle the 2×8 to the log.

With my eye and hearing protection in place, I set the sawmill for a 5"-deep cut and make the initial slabbing cut as shown in *photo A*. With a sharp chain I can make this slabbing cut through an oak log in less than two minutes.

Continued

CHAINSAW-MILL GUIDE


#14 x 4½" F.H. wood screw (2 required)
2 x 8, 12' long
⅛ x 2 x 2" angle iron 10' long
#10 x 1¼" panhead sheet metal screws spaced 12" apart along length of angle iron

The chainsaw-mill guide controls the initial slabbing cut.

Milling your own lumber often yields boards with the kind of beautiful grain figure that you won't find at a lumber retailer.

SAW AND SAVE

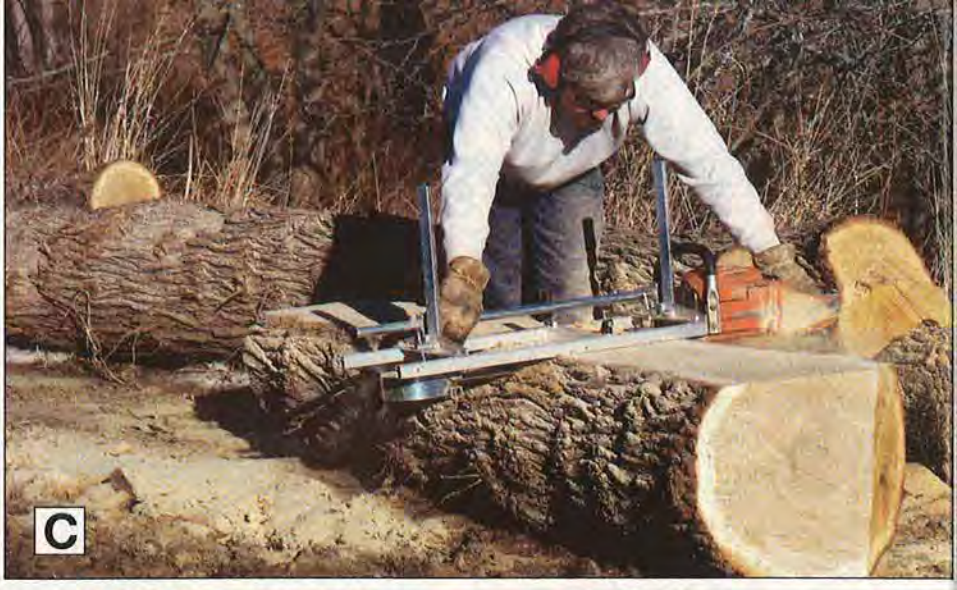
This cut gives me a first peek at the grain color and figure inside the log. Even now, having cut many logs in all sorts of species, I still get a thrill every time a log reveals this inner beauty. For example, the white oak logs shown in this article yielded lots of wavy grain and splotches of bird's-eye figure as shown in *photo B*. Imagining how I will use this figure in projects helps make the hours of cutting go by quickly.

Now, with a flat plane established on the log, I remove the 2×8 guide and set the mill for a 1¼"-deep cut (this yields 1"-thick boards after shrinkage from drying and planing). I've found that only boards 2½" or more in thickness require me to wedge the cut open to prevent the board from pinching the saw bar.

I make successive cuts as shown in *photo C* until my mill is within an inch or two of the ground. What remains of the log is light enough that I can prop it up a few inches with scrap pieces of wood before making the final cuts. I place wedge blocks around the bottom of the log to stabilize it.

Note: *Even though the maximum cutting width of my sawmill is 26½", I once used it to mill a 42"-diameter log from an oak tree that was close to 200 years old. To do this, I rotated the log 180° after making the initial slabbing cut and one board cut. Then, I made another slabbing cut and board cut, and rotated the log 90°. At this point I could saw completely through the log without rotating it any further.*

Guiding the sawmill through the cut requires little effort on my part. If the log is on a slight downhill the mill will pull itself through the cut. About the only discomfort I experience is a tingling in my hands and some stiffness in my lower back. Padded gloves help with the vibration. To prevent my back from getting too sore, I alternate between standing, crouching, and kneeling during the cutting. I also take a break after every log and go for a short walk. I've tried back support devices, but they seem too restricting for this type of work.



Above: **The flat plane established by the slabbing cut guides the mill through subsequent cutting passes.**

To keep the saw cutting efficiently, I resharpen the chain after every four boards. For fast sharpenings I use a cylindrical grinding stone and a battery-powered rotary tool such as the Dremel model in *photo D*. (Granberg sells a car-battery-powered sharpener that's faster yet.) Even with a sharp chain, it may take five or six minutes to complete cuts in the center of an oak log.

Working this way, I can typically make 200–250 board feet of 5/4 oak boards in a six-hour period. I haven't had the chance to cut softwood logs, but I would imagine that the cutting would go much faster. I also intend to buy an auxiliary oiler that mounts to the far end of the bar ($33 from Granberg). My saw's automatic oiler doesn't put out enough oil to keep up with such heavy-duty use, and the auxiliary oiler should make the cutting go faster with less wear on the saw.

After I get my boards home, I stack and sticker them in the same order that they came out of the log. (See *photo E* of some of my outdoor stacks.) This makes it easier to match woods later during project construction. I leave the bark on the boards, and seal the ends with latex paint to slow the drying. I cover the pile with anything that will shed rain, typically old plywood or plastic panels weighted with concrete blocks or slabbing cuts from the milling. After one year of air-drying, the wood gets down to about 12–14 percent moisture content (MC). I live in Iowa; in other areas of the country the boards may air-dry to a higher or lower MC.

A battery-powered rotary tool and cylindrical grinding stone help speed frequent sharpening chores.

I stack and sticker the boards in the order they came from the log. Then, I seal the ends with latex paint.

During the dehumidification-drying process, I check relative air humidity and temperature daily. I periodically uncover the stack to check the wood moisture content.

Then, I bring the boards down to about 7 percent MC over a 2-3 week period using the low-tech, but effective, dehumidification setup shown in *photo F*. To make this small kiln I first lay a sheet of plastic on the concrete floor of my garage workshop and stack and sticker the boards on top of this sheet (with the bottom boards a few inches off the floor). I place a dehumidifier, fan, thermostat, and relative humidity gauge next to the stack and cover everything with another sheet of plastic. While the dehumidifier dries the air within this "tent," the fan circulates air for even drying throughout the stack.

I adjust the humidistat on the dehumidifier each day to keep the relative humidity inside the tent at about 30-35 percent, and the temperature in the 85-90° Fahrenheit range. For the dehumidifier to work effectively, the air outside the tent should be at least 60°. As the wood nears 8 percent MC, the temperature inside the tent may climb as high as 105°. Then, I uncover the stack and check the MC of the wood with a moisture meter. At 7 percent MC I turn off the dehumidifier, re-cover the stack, and let the fan run for two days just to make sure that the entire stack has stabilized at 7 percent.

This setup cost me nothing because I already owned all of the necessary equipment. And, I feel that my patient approach to drying lumber yields higher-quality stock than I could buy. For more on drying lumber see these issues of *WOOD*® magazine:

- February 1993, "How to succeed at air-drying lumber," pages 40-41.
- June 1994, "*WOOD* magazine builds a solar kiln," pages 44-46.

Pros and cons to consider

The versatility and economical price of a chainsaw mill make it the ideal choice for me. Other points in favor of these mills:

- You can cut curved logs because the mill follows the contour of the log.
- I've used my mill to saw logs in tight city backyards that make the log inaccessible to a trailer-based mill. It's a lot easier to move boards than logs!

On the other hand, I don't recommend a chainsaw mill if you have more money than time. You'll spend a full day dealing with a single large hardwood tree. Also, keep the following in mind:

- A chainsaw makes a ⅜" kerf, so a lot of the log is turned into sawdust (especially compared to a bandsaw mill). Since I harvest free trees otherwise destined to be firewood, the amount lost to sawdust doesn't deter me.
- You need a strong, sturdy back. I'm in my early 40s and in average physical condition. I hope I'm able to handle this rig 15 or 20 years from now, but I'm not counting on it. And that's okay because my friends tell me I've already amassed enough wood for three lifetimes!

Buying Guide

For more information on the Alaskan Saw Mill Attachment, contact Granberg International, P.O. Box 425, Richmond, CA 94807-0425. Call 510/237-2099.

Written by Dave Henderson with Bill Krier Photographs: Bill Krier

WOOD® INDEX

CUMULATIVE INDEX FOR ISSUES 86–94

The next time you're looking for a project or feature story in issues **86** through **94**, use this handy reference to help you find it fast. We kept it simple. For instance, when searching alphabetically for a breadboard project story, you'll find "Breadboard, **92**:64-65." To locate the story, go to issue **92**, page 64.

A-C

Ailanthus, **91**:13
Air-filtration systems, **86**:28
Airplane riding toy, **89**:50-55; **92**:4
Air-powered nailers, **94**:98
Angles:
  bisecting, **93**:6
  miter, **94**:4
Antique/collectible tools:
  planes, **93**:28; **94**:20-21
  scrollsaws, **87**:36-37
  window display, **91**:20
Appliqué, scrollsaw, **88**:1, 53-55
Bandsaws:
  adjusting, **88**:12
  boxes made on, **90**:35-39
  carrier used on, **92**:23
  fence for, **92**:22
  found wood cut on, **87**:18
Barometer/clock, **93**:54-56
Basket, laced, **93**:48-50
Benches, picnic, **88**:38-43
Biscuit joiners, **90**:82; **94**:92
Bits. *See* Drill bits; Router bits
Blade wrench, bending, **88**:28
Boards. *See* Edge-gluing
  color-coding, **89**:20
  drying, **92**:30
  movement, **90**:72-78; **93**:6
  sniping, **92**:31, 75
Boatbuilder, **87**:100
Boat pull toy, **90**:66-67, 100
Boat restoration, **86**:68-72
Boot plaque, inlay, **93**:36-37
Bottle stoppers, **91**:58-61
Boxes:
  bandsawn, **90**:35-39
  clamping, **94**:55
  hinge alignment, **90**:26
  jewelry, **93**:40-45
    finish for, **90**:12, 14
Box joints, **87**:88
Brass:
  nativity scene, **93**:46-47
  turning, **87**:74-76
Breadboard, **92**:64-65
Breadboard ends, tables with, **89**:36-41; **90**:77
Bronze-look finish, **87**:70-73
Brushes, cleaning, **87**:16; **91**:34
Build-A-Toy® contest, **88**:100; **91**:8, 10, 12, 17-18
  winner's plans, **92**:104
Burls, **94**:39-41
Business, woodworking, **87**:24; **92**:80; **94**:22
Buymanship:
  drills, cordless, **89**:1, 56-63
  mitersaws, sliding compound, **87**:40-45
  planers, **92**:74-79; **94**:6
  random-orbit sanders, **90**:50-55
  scrollsaws, **91**:50-57; **93**:6; **94**:6
  shapers, **86**:44-49
Cabinets:
  base, leveling, **88**:6
  clamping, **94**:55
  kitchen, **94**:56-57, 59-61
  roll-around, **91**:48-49
  sewing and knitting supplies, **88**:56-61
  sewing machine, **94**:68-76
  wall, **94**:46-49
Calipers, **90**:8, 10
Candlesticks, **86**:58-59
  proportions for, **91**:24
Cardinal, carved, **94**:64-67
Caricature carving, **88**:62-65
Carousel horse, **88**:100
Cars, toy, **93**:60-64
Carving:
  cardinal, **94**:64-67
  caricature, **88**:62-65
  carousel horse, **88**:100
  chip carving, **86**:33-37
  Congress, **88**:100
  Lincoln bust, **90**:68-71
  Paragrave tool, **92**:18
  with router, **88**:96
Casters, securing, **92**:27
Cedar, **94**:18
  finishing, **88**:43; **90**:30
Chairs:
  doll, **93**:51-53
  rungs, fitting, **88**:22

Print this article

Cherry, black, **90**:29
Chess set, **91**:37
Children's items. *See* Toys
Chime, desk, **87**:57-59
Chip carving, **86**:33-37
Christmas decorations, **92**:1; **93**:46-47, 57-59
Circular saw, portable, setting fence for, **87**:22
Clamps and clamping, **94**:50-55. *See* Edge-gluing
  of angled shapes, **90**:16
  corner brackets for, **90**:25
  of edge banding, **88**:6
  glue blocks for, **90**:39
  handscrew:
    as bench vise, **93**:16
    on ribbed tables, **88**:20
  lever-operation, **87**:98
  miter, **93**:66-69; **94**:54
  pipe, **90**:99
    pads for, **94**:102
  shop-made, **89**:22
  small-part, **89**:18; **91**:98
  spring-loaded, **90**:80
  table for, **93**:14
  threaded-rod, **88**:28; **93**:68
  toggle-clamp jig, **87**:16
Clocks:
  with barometer, **93**:54-56
  reproductions, **92**:39-43
  tall, **90**:60-65
    parts for, **88**:12
  watch-shaped, **90**:56-57
Coasters, flamingo, **86**:50-51
Coat tree, **88**:72-75
Compound miters, **87**:5-6; **92**:4, 8
Compound mitersaws, **88**:10
  sliding, **87**:40-45
Contact cement:
  cleaning off, **87**:8
  water-based, **87**:96
Corian clock/barometer, **93**:54-56
Corner templates, **91**:102
Cradle, doll, **90**:40-43
Crafts-fair marketing, **92**:80
Craftsman Closeups:
  bandsawn boxes: Michael Elkan, **90**:35-39
  chip carving: Pam Gresham, **86**:33-37
  clocks: Edward Stone, **92**:39-43
  furniture, classic: George Reid, **89**:31-35
  furniture, miniature: Don Perkins, **88**:33-37
  hats, turned: Johannes Michelsen, **91**:39-43
  puzzles, animal: Peter Chapman, **94**:33-36, 78
  toys: Gus Stefureac, **87**:35-37
  wood-inlay relief: Wolf Moller, **93**:33-37
Cribbage board holes, drilling, **88**:79; **93**:4
Cruet set, **91**:58, 61

D-E

Desks, **86**:52-57; **91**:36
Detail sander, **86**:78
Detail tools, rotary, **88**:8; **92**:18
Disabled persons, woodworking for, **94**:62-63
Doll furniture, **93**:51-53
  cradle, **90**:40-43
Door frame, squaring, **93**:22
Doormat, **94**:42-45
Dovetail joints:
  hand-cut, **87**:66-69
  sliding, **90**:77
Doweling of curved joints, **87**:30
Drawer joints, **92**:57, 58
Drawer pull, turning, **87**:76
Drill bits, **91**:insert
  brad-point, small, **90**:4
  Forstner, **90**:80
  tiny, holding, **90**:18
Drill guide, steadying, **87**:20
Drill press:
  clamps for, **87**:98
  cribbage board made on, **88**:79; **93**:4
  fence for, **92**:22
  as mini lathe, **93**:99
  rosette cutters for, **91**:22
  sanding attachments:
    drums, **86**:24; **93**:92
    oscillating spindle, **90**:81
  speed chart, **91**:insert
  table, **86**:1, 38-43
    leveling, **91**:insert
  vertical-hole jig, **92**:26
Drills, cordless, **89**:1, 56-63
Drying of wood, **92**:30
Dust collection and control:
  air-filtration systems, **86**:28
  bag, holding, **90**:18
  blast gate, **89**:24
  grounding wires, **87**:8
  hose connectors, **87**:23
  for planers, **92**:78
  for random-orbit sanders, **90**:53
  separator, **92**:100
  shroud retrofit, **94**:97
  for tablesaw, **87**:12
  vacuums, **86**:78; **89**:20
Edge banding, clamping, **88**:6
Edge-gluing, **90**:32; **94**:51-53
  jointing before, **92**:28; **93**:24; **94**:51-52
  for plywood panels, **91**:65
  ripping edges for, **88**:78
  wedges for, **88**:4
Electrical wiring, **88**:14, 16; **94**:4
Engraving tool, **92**:18
Étagère, **88**:66-69; **89**:16
Extension-cord holder, **88**: 96

F-G

Family tree, inlaid, **91**:37
Farm scene, scrollsawn, **89**:64-65
Feet, project, **92**:25
Filler, sawdust as, **91**:24
Finishes:
  for cedar, **88**:43; **90**:30
  lacquer, gloss, **90**:12, 14
  metal, antique, **87**:70-73
  polyurethane, **86**:18
  preparation for, **86**:16, 18
  over shellac sealer, **93**:22
  spray paint, **89**:29-30
Forest products, **93**:76-78
  burls, **94**:39-41
  certification of, **86**:96
  efficient use of, **93**:77-78
  redwoods, **88**:44-48, 76
  tropical hardwoods, **94**:104
Forstner bits, **90**:80
Fractions, **92**:10, 12
Frame-and-panel doors:
  bits for, **86**:28; **89**:46-49
  wood movement, **90**:76, 78
Frames:
  clamping, **93**:66-69; **94**:54
  compound miters, **87**:5-6
  squaring, **93**:22
Fretwork, **91**:104
Furnituremaker, **89**:31-35
Futon, **86**:60-65
Glue:
  contact cement, **87**:8, 96
  refilling bottle, **94**:12
  slow-setting, **89**:10
  tote for, **86**:94
Glue-ups. *See* Edge-gluing
Golden rectangle, **91**:24
Gouges, use of, **90**:33
Grain of wood, **94**:8, 10
Grinder, dust shroud, **94**:97
Grooves, stopped, **93**:20

H-I

Half-lap joints, **90**:58-59
Hats, turned, **91**:1, 39-43; **94**:104
Hemlock, western, **94**:31-32
Hinges, box, aligning, **90**:26
Holesaw:
  plug grabber for, **88**:24
  for wheel tires, **91**:26
Holly, **93**:104
Hooks, tool, **88**:98
Intarsia, 3-D, **93**:33-37

J-M

Jar lids, turned, **91**:58-60
Jenny (plane), **93**:28
Jewelry boxes, **93**:40-45
  finish for, **90**:12, 14
Jigs:
  angle-clamping, **90**:16
  cribbage-board drilling, **88**:79; **93**:4
  drill-press, **86**:1, 38-43
  groove-cutting, **93**:20
  miter-cutting, **90**:4
  miter-gauge fence, **86**:20
  pocket-hole, Kreg, **87**:78
  ripping, **88**:94
  router-table multijoint, **87**:1, 50-56, 88
  sign-routing, **92**:44-49
  spline-cutting, **93**:42

Continued

tablesaw, sliding, **93**:1, 70-75, 100, 102
tenoning, **93**:90
toggle-clamp, **87**:16
turning-square chamfering, **92**:23
vertical-hole, **92**:26
Jointers, **87**:26
adjusting, **91**:74-78; **93**:24; **94**:51-52
Joints and joinery. *See* Edge-gluing; Miters; Mortise-and-tenon joinery
biscuit, **90**:82; **94**:92
curved, doweling, **87**:30
dovetails, **87**:66-69
half-lap, **90**:58-59
pocket-hole jig, **87**:78
router-table multijoint jig, **87**:1, 50-56, 88
wood movement, **90**:76
Kaleidoscope, **89**:44-45
Kazoo, **92**:66-67
Keyhole hangers, **94**:12
Key ring, puzzle, **94**:78
Kickback, avoiding, **91**:83-84
Kitchen planning, **94**:56-61
Kit furniture, **86**:73-76
Knitting center, **88**:56-61
Lacquer, gloss, **90**:12, 14
Laminates, plastic, **87**:8
positioning, **92**:24
trimming, **89**:10
Lamps:
floor, **88**:72-75
stenciled, **92**:62-63
Larch, **92**:33-34
Lathes. *See* Turning
accessories, **92**:28
as disc sander, **90**:27
parts kit, **88**:12
safety, **94**:24, 26
tools, storing, **94**:16
vertical, **93**:99
Legs, turned, **89**:42-43; **90**:45-46
Lincoln, Abe, bust, **90**:68-71
Lock miter bits, **86**:10, 12, 14
Logging, **93**:76-77
burl, **94**:39-41
redwood, **88**:44-48, 76
Lumber. *See* Boards, Forest products
Lumber rack, **87**:14
Magicians' equipment, **93**:104
Mailbox, **86**:66-67
Manchineel, **94**:101
Mandolin, octave, **91**:36
Maritime Heritage Alliance (MHA), work of, **86**:68-72
Measuring and marking:
calipers, **90**:8, 10
corner templates, **91**:102
fractions, **92**:10, 12
proportions, **91**:24
radius, marking, **88**:78
Metal:
nativity scene, **93**:46-47
turning, **87**:74-76
Metallic finish, **87**:70-73
Miniature furniture, **88**:33-37
Mirror/shelf combo, **87**:46-49
Mission-style floor lamp/coat tree, **88**:72-75
Miter-gauge fence, **86**:20
Miters, **94**:54
angles, **94**:4
for arched molding, **90**:30
clamps, **93**:66-69; **94**:54
compound, **87**:5-6; **92**:4, 8
jig for cutting, **90**:4
lock miter bits for, **86**:10, 12, 14
Mitersaws, compound, **88**:10
sliding, **87**:40-45
Moldings:
arched, mitering, **90**:30
planer/molder for, **93**:80
plastic T-molding, **86**:4, 6
routing, **94**:14
and wood movement, **90**:78
Mortise-and-tenon joinery:
chair-rung tenons, **88**:22
jigs for:
router-table, **87**:54-56
tenoning, **93**:90
wedges, use of, **88**:4
wood movement in, **90**:76
Motors, universal, **88**:80
Mountain laurel, **89**:86
Movement of wood, **90**:72-78; **93**:6

N-P

Nailers, air-powered, **94**:98
Nails, pulling, **90**:24
National Register of Big Trees, **91**:104
Nativity, brass, **93**:46-47
Needlecraft center, **88**:56-61
Nightstand, Shaker, **90**:44-47
Ornaments, tree, **93**:57-59
Oscillating spindle sanders, **87**:78; **90**:81; **92**:92
Outdoor furniture, **88**:38-43
Owl, spotted, **88**:76
Paintbrushes, cleaning, **87**:16; **91**:34
Painting:
small parts, **89**:18
spray finishes, **89**:29-30
stenciling, **92**:14, 16
Patina finish, **87**:70-73
Patio furniture, **88**:38-43
Paw prints, removing, **93**:24
Pen case grooves, **93**:20
Pencil tray, **87**:71-72
Perfboard hooks, **88**:98
Physically disabled, woodworking for, **94**:62-63
Pianos, Steinway, **90**:48-49
Picnic furniture, **88**:38-43
Pine, western white, **87**:33-34
Planers, **92**:74-79; **94**:6
planer/molder, **93**:80
sniping, **92**:31, 75
tuning up, **91**:79-81
Planes:
block, **93**:8, 10
core-box, **94**:20-21
transitional, **93**:28
Planing, jointer for, **87**:26
Planter, indoor, **91**:62-65
Plaques:
cowboy-boot, **93**:36-37
welcome, **87**:70-71
Plastic laminates, **87**:8
positioning, **92**:24
trimming, **89**:10
Plastic T-molding, **86**:4, 6
Plate (biscuit) joiners, **90**:82; **94**:92
Playhouse, **87**:60-65
Plug cutters, **94**:90
Plug grabber, **88**:24
Plywood:
edges, finishing, **86**:4, 6; **88**:6
hoop-pine, **90**:104
scraps, using, **91**:65
Pocket-hole jig, **87**:78
Polyurethane finishes, **86**:18
over shellac sealer, **93**:22
Poplar, yellow, **92**:104
Power tools. *See* individual names
for starting shop, **88**:89
tuning up, **91**:66-81
Project Showcase, **91**:36-37
Proportions, figuring, **91**:24
Pull, drawer, turning, **87**:76
Punched-tin (wall) cabinet, **94**:46-49
Puzzles, animal, **94**:33-36, 78

Q-S

Radial-arm saws:
blade guard, **91**:33
blade-stop block, **87**:16
hold-down, **91**:28
vs. sliding compound mitersaws, **87**:41
Radius, marking, **88**:78
Rail-and-stile router bits, **86**:28; **89**:46-49
Random-orbit sanders, **88**:81; **90**:50-55
Reciprocating saws, **91**:100
Redwood:
burls, **94**:39-41
finishing, **88**:43
logging, **88**:44-48, 76
and spotted owl, **88**:76
Resawing on tablesaw, **91**:22
Ripping:
gluing edges, **88**:78
guide, **92**:20
jigs, **88**:94
thin-strip, **88**:94; **91**:83-84
Rocker spindles, repairing, **87**:28
Rocking horses, **93**:104
Rosette cutters, **91**:22
Rotary detail tools, **88**:8
Paragrave, **92**:18
Router bits:
CMT, **91**:4; **92**:8
flush trim, **94**:18
lock miter, **86**:10, 12, 14
rail-and-stile, **86**:28; **89**:46-49
setup templates, **93**:17
shapers using, **86**:44-49
V-groove, **88**:96
Routers. *See* Router bits
carving with, **88**:96
laminate trim with, **89**:10
moldings cut on, **94**:14
multijoint jig, **87**:1, 50-56, 88

plunge, **93**:88
pushshoe, **93**:80
signs made with, **92**:44-49
speeds, **88**:93
Safety:
comic book about, **89**:88
electrical, **88**:14, 16
kickback, **91**:83-84
lathe, **94**:24, 26
Sanders and sanding, **86**:16
cedar and redwood, **88**:43
detail, pneumatic, **86**:78
disc, lathe as, **90**:27
drum, **89**:4; **93**:92
sandpaper on, **86**:24, 26
dust shroud, **94**:97
finishing, ½-sheet, **88**:81
oscillating spindle, **87**:78; **90**:81; **92**:92
random-orbit, **88**:81; **90**:50-55
right-angle block, **88**:20
small-part board, **88**:29
Sawdust as filler, **91**:24
Sawhorse, **94**:93
Schools:
crafts program, **87**:38-39
shop class, **89**:66-68
Scrapers, use of, **90**:33
Scrollsaws, **91**:50-57; **93**:6; **94**:6
antique, **87**:36-37
appliqué, **88**:1, 53-55
blade changing, **91**:52-53
blade storage, **90**:21
bucking bronco pencil tray, **87**:71-72
farm scene, **89**:64-65
flamingo coasters, **86**:50-51
fretwork made on, **91**:104
lighting of cut, **90**:28
mailbox, **86**:66-67
nativity, brass, **93**:46-47
seminars, **86**:96
stands for, **91**:14, 51-52
throat plate, **89**:26
wagonette, **88**:70-71
welcome plaque, **87**:70-71
Sequoia, giant, **88**:30
Sewing centers:
sewing machine, **94**:68-76
sewing supplies, **88**:56-61
Sewing kit, turned, **92**:50-52
Shaker nightstand, **90**:44-47
Shapers, **86**:44-49
Shellac, finish over, **93**:22
Shelves:
lighted unit, **91**:44-47
tower of, **88**:66-69; **89**:16
wall-hung, **91**:36-37; **92**:59-61; **94**:46-49
with mirror, **87**:46-49
Ship restoration, **86**:68-72
Shop class, **89**:66-68
Shop skills:
half-lap joints, **90**:58-59
wedges, wooden, **88**:4, 6
Shop-tested technique: sign routing, **92**:44-49
Sideboard, **92**:54-58
Sign routing, **92**:44-49
Snipe on boards, **92**:31, 75
Snowman decorations, **92**:1
Sofa, futon, **86**:60-65
Spindles, repairing, **87**:28
Spline-cutting jig, **93**:42
Stabilized wood, **89**:14; **94**:6
Staplers, air-powered, **94**:98
Steamboat toy, **90**:66-67, 100
Steam engines, **90**:104
Stenciling, **92**:14, 16, 62-63
Stickering of wood, **90**:75; **92**:30
Stoppers, turned, **91**:58-61
Storage:
drop-down tray, **93**:12
glue tote, **86**:94
hooks, tool, **88**:98
of lathe tools, **94**:16
lumber rack, **87**:14
roll-around, **91**:48-49
of scrollsaw blades, **90**:21
Sweet gum, **93**:30

T-V

Tables:
dining, **91**:36
doll, **93**:51-53
kitchen, country, **89**:36-41
nightstand, **90**:44-47
picnic, **88**:38-43
wood movement in, **90**:77
worktable, folding, **94**:6
Tablesaws:
blade alignment, **91**:70-71
blade changing, **88**:28
dust from, catching, **87**:12
fence alignment, **90**:20; **91**:73
fence straightening, **91**:73
gluing edges ripped, **88**:78
Jet XACTASAW Left, **91**:98
jig, sliding, **93**:1, 70-75, 100, 102
resawing with, **91**:22
ripping guide for, **92**:20
ripping jigs for, **88**:94
tenoning jig for, **93**:90
tuning up, **91**:68-73
Tamarack, **92**:33
Tape, double-faced, **89**:16
Templates:
corner, **91**:102
material for, **92**:92
Tenoning jig, **93**:90
Tenons. *See* Mortise-and-tenon joinery
Thin-strip ripping, **88**:94; **91**:83-84
Threaded-rod clamps, **88**:28; **93**:68
Timber. *See* Forest products
T-molding, plastic, **86**:4, 6
Toys:
biplane, riding, **89**:50-55; **92**:4
boat, pull, **90**:66-67, 100
cars, **93**:60-64
contest, **88**:100; **91**:8, 10, 12, 17-18; **92**:104
doll furniture, **93**:51-53
cradle, **90**:40-43
maker of, **87**:35-37
playhouse, **87**:60-65
rocking horses, **93**:104
truck, farm, **92**:68-73
wheel tires, **91**:26
Train, folk-art, **94**:104
Triangle, drafting, **89**:14
Truck, farm, **92**:68-73
Tuliptree, **92**:104
Tune-ups for tools, **91**:66-81
Turning. *See* Lathes
brass, **87**:74-76
candlestick, **86**:58-59
clear view of, **91**:32
clock columns, **93**:54-56
half-round pieces, **91**:30
hats, **91**:1, 39-43; **94**:104
kaleidoscope, **89**:44-45
legs, **89**:42-43; **90**:45-46
new materials for, **87**:96
sewing kit, **92**:50-52
squares, chamfering, **92**:23
stopper tops, **91**:58-61
tools, use of, **90**:33
tree ornaments, **93**:57-59
Vacuum, shop, **86**:78
wands, loosening, **89**:20
Verdigris finish, **87**:70-73
Vises:
for angled parts, **90**:16
handscrew clamps as, **93**:16
miter, **93**:66-67

W-Z

Wagonette, model, **88**:70-71
Walnut, black, **91**:104; **92**:36
Warped boards, **90**:74-75
Wax, lubricating, **92**:102
Wax polish, **91**:98
Wedges, **88**:4, 6; **90**:16, 24
ripping, jig for, **88**:94
Welcome mat, **94**:42-45
Welcome plaque, **87**:70-71
Wheel tires, toy, **91**:26
Wiring, **88**:14, 16; **94**:4
Wood movement, **90**:72-78; **93**:6
WOOD ONLINE, **89**:82; **90**:1
Wood species. *See* Redwood
ailanthus, **91**:13
cedar, kinds of, **94**:18
cherry, black, **90**:29
hemlock, western, **94**:31-32
holly, **93**:104
larch, western, **92**:33-34
manchineel, **94**:101
mountain laurel, **89**:86
movement of, **90**:73-74
pine, western white, **87**:33-34
poplar, yellow, **92**:104
sequoia, giant, **88**:30
sweet gum, **93**:30
walnut, **91**:104; **92**:36
yew, **89**:88
Wood stabilization, **89**:14; **94**:6
Workbench:
fold-down benchtop, **94**:14
with rolling cabinets, **91**:48-49
securing work on, **88**:6
Workshop:
renting, **88**:100
starting, **88**:89
Work supports, **87**:10; **94**:93
joist-hung, **88**:26
Worktable, folding, **94**:6

Natural-Born

A woodpecker for your door

Tapping on a door: Now, there's a task ideally suited to a woodpecker. With our dandy door-knocker project, you can have a bird on the job in just a few hours. It would be great on the door to a kid's room or as a novelty for your own front door.

First, build the bird

1 Trace the outline for the woodpecker's body (*page 92*) onto a piece of hardwood ½×3×6½". Either birch or basswood would be a good choice for the painted bird. When tracing, a straightedge and a French curve or flexible ruler will help you follow the lines neatly and accurately.

2 Bandsaw or scrollsaw the body. A ⅛" bandsaw blade or a #5 scrollsaw blade (.038×.015" with 12½ teeth per inch) will do the job.

3 Mark the location for the 1/16" hole on the side of the body. Using a drill press, drill the hole through the body. Chuck the 1/16" bit in a portable drill, and drill the hole centered on the edge of the body where shown.

4 File or sand round-overs along both sides of the head and body, except on the beak and the tail. For uniformity, copy and cut out the Round-over Radius Guide to gauge your work. Taper the beak to ¼" wide at the tip, and shape it to the cross section shown.

5 Trace the tail outline and two wing outlines onto ¼" stock. Both wings fit on a ¼×2½×6½" piece, and the tail on one ¼×2×2". Scrollsaw the wings and tail.

6 Round over the outside face of each wing, utilizing the same radius guide used for the body. Sand a slight round-over—just enough to break the sharp edge—along the back of each wing.

7 Glue the tail to the body where indicated. After the glue dries, sand the tail to the cross section shown. The body and tail should be flush on both top and bottom.

8 Finish-sand the body/tail assembly and the wings. Glue the wings to the body.

9 After the glue dries, paint the bird with acrylic craft paints. (Or, use enamel paints if your woodpecker will be exposed to weather.) You can follow our color scheme or invent your own.

Make the metal feet

1 Copy the foot pattern twice. With spray adhesive, attach the patterns to two 2×2" pieces of copper about 1/32" thick. (We bought a .025×4×10" sheet of copper, packaged as K&S no. 259, at a hobby shop.)

2 Drill the ⅛" hole where shown in each foot. For drilling, clamp the piece, with a scrapwood backup, to your drill-press table.

3 Cut away the excess copper around the foot with tin snips. Then, using your bench grinder or drum sander and small files, finish shaping the feet. When grinding or power-sanding copper, remember that the metal readily conducts heat and can get hot from friction. To grip the small foot for filing, sandwich it between two pieces of scrapwood clamped in a vise. Keep the guideline as close as possible to the supporting scrapwood pieces.

4 Flatten the feet if necessary, using a block of scrapwood as an anvil and a rubber or wooden mallet. Sand the edges to eliminate file and grinder marks.

5 Attach a foot to each side of the body with a #2×¼" roundhead wood screw. Leave the screws loose enough that the feet can move freely on the body. Screw a

Knocker

#216½ brass screw eye into the hole in the front of the body. Tie one end of a 12" length of string to the screw eye.

Now, complete the knocker

1 Center the assembled woodpecker on a ½×2×10" piece of maple. On the board, mark the locations of the tabs on the feet.

2 Using the marks, lay out two slots on the board to accept the tabs on the woodpecker's feet. Drill a 1/16" blade start hole at one end of each slot, then scrollsaw the slots.

3 Fit the tabs on the feet into the slots. Mark the spot where the bird's beak strikes the board. Draw a center for a mounting hole at that point. The same distance from the bottom of the board, draw another center for the other mounting hole.

4 At the centers you just marked, drill ¼" holes 3/16" deep. Drill the rest of the way through with a 7/64" bit.

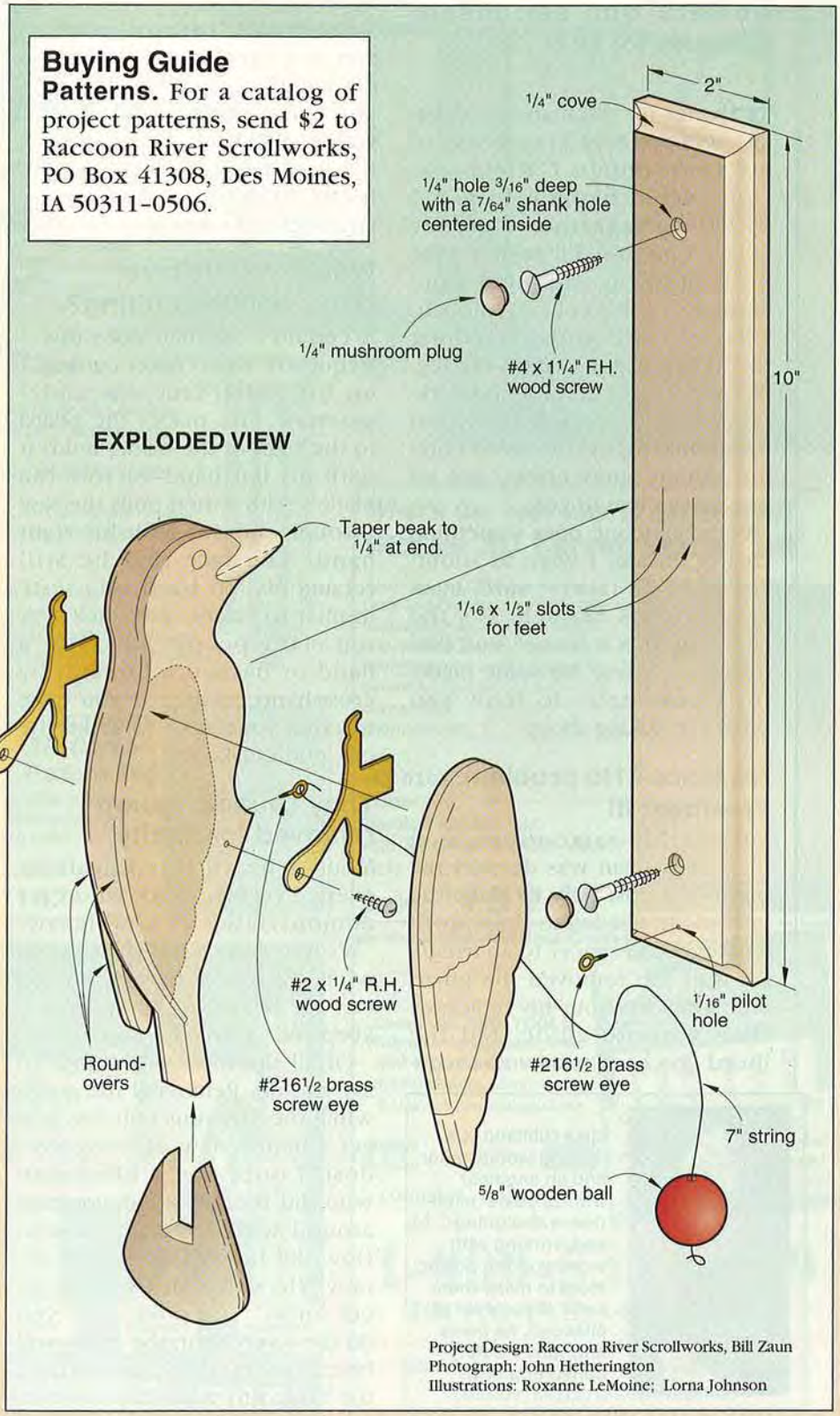
5 Rout a ¼" cove around the front face of the board. To prevent tearout, form the cove in two or three shallow passes.

6 Finish-sand the mounting board, and apply a clear finish. Drill a 1/16" pilot hole near the bottom centered side to side, and screw in a #216½ brass screw eye. Attach the mounting board to the door with #4×1¼" flathead wood screws. Cover the screw heads with ¼" mushroom plugs.

7 Put a drop of cyanoacrylate adhesive (instant glue) at the end of each foot tab. Then, push the tabs into the slots. Pass the end of the string through the screw eye on the mounting board. Adjust the length to your preference, and pass the string through a hole in a 5/8" wooden ball. Knot the end to retain the ball.

Buying Guide

Patterns. For a catalog of project patterns, send $2 to Raccoon River Scrollworks, PO Box 41308, Des Moines, IA 50311-0506.


2"
1/4" cove
1/4" hole 3/16" deep with a 7/64" shank hole centered inside
1/4" mushroom plug
#4 x 1 1/4" F.H. wood screw
10"
EXPLODED VIEW
Taper beak to 1/4" at end.
1/16 x 1/2" slots for feet
#2 x 1/4" R.H. wood screw
1/16" pilot hole
Round-overs
#216 1/2 brass screw eye
#216 1/2 brass screw eye
7" string
5/8" wooden ball

Project Design: Raccoon River Scrollworks, Bill Zaun
Photograph: John Hetherington
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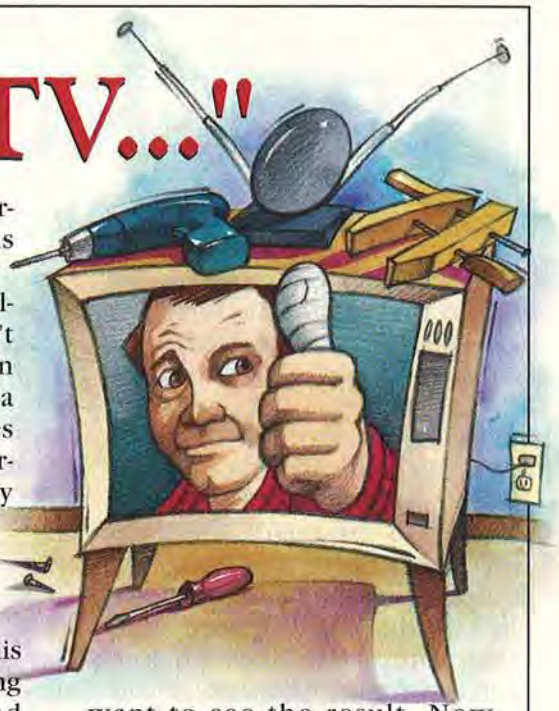
"But I saw it on TV..."



Safety Man Mike Gililland unloads on television woodworkers who set unsafe examples for all of us.

Thanks for the many good letters you sent in response to my last column ("Kickback: Don't let it happen to you," *WOOD*® magazine, October 1996). I promise I'll answer your best questions the next time around. For this column, though, I have to deal with something that recently got to me—my regular weekend fare of woodworking and do-it-yourself television programs. Many TV hosts commit blatant safety errors, and no one takes them to task.

When someone does something clearly unsafe, I want to shout: "DON'T DO THAT!" Sure, inadvertent slips happen. It's the "don't try this at home" stuff that upsets me. Here are some made-for-TV examples to show you what I'm talking about.

No fence? No problem. Freehand it!

On one big-name program, a local tradesman was demonstrating to the host how to make the curved cut needed to properly fit a cabinet-end spacer to an irregular wall. He removed the guard and spreader from his tablesaw, then with no guide, fed the board freehand to saw an irregular kerf. "Slick!" said the narrator. My comment remains unprintable here.

Flat blades (table or radial-arm and circular saws) aren't designed to cut curves. When you force them, you risk a violent kickback. Sometimes it's hard enough to cut perfectly straight let alone try any freehand sawing.

Would you believe cross-handed cutting?

A certain craftsman does this frequently when miter-cutting on his radial-arm saw and mitersaw. He places the board to the right of the blade, holds it with his left hand—across the blade's path—then pulls the saw through the cut with his right hand! The fact that he still retains his left hand isn't testimonial to talent, just luck. Far too many people have lost a hand or hacked a forearm by cross-hand cutting. If you have to cross your arms to make the cut, don't make it.

They caution "guard removed for clarity"

You've heard this line from every TV personality who ever demonstrated at a tablesaw: "We've removed the guard while the saw is running so you can see better. At home, please keep your guards in place."

Of all the foolhardy things to say and do. Removing the guard while the saw runs only lets you get a better view of flying sawdust. I once met a blind man who did the finest cabinetwork around with a radial-arm saw. How did he manage such accuracy? He said, "Measure twice, cut once." The point is, if you do the setup right, the result will be right. You don't need to see the blade throwing chips; you want to see the result. Now, there's nothing wrong with photographing a tablesaw without a guard to better show a setup. It's quite another thing, though, to start the saw and make the cut.

"Look folks, watch me pinch the blade"

To emphasize the importance of the spreader on his tablesaw, a TV-workshop star took off the guard and spreader and started to rip a board. Halfway into the rip he stopped feeding, reached over and behind the blade, and pinched the kerf closed! After my heart restarted, I noticed he was still smiling and talking—with all his fingers. I have that on video.

His focus was the unwanted saw marks where the blade was pinched. I screamed, "What about kickback?" A spreader does a lot to prevent kickbacks. Yet, if deleting saw marks is reason for you to keep them on your saws, okay. And at the risk of offending those folks I watch on TV, let me just add: "DON'T DO THAT!"

Mike Gililland is a lifelong woodworker and an engineer with 25 years' experience designing and working with woodworking power tools to make them safer. A resident of Missouri, he owns and runs a safety-consulting firm.

Send your safety-related question, stated simply, with a SASE to:
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Not all questions will be published, but each will receive a reply.

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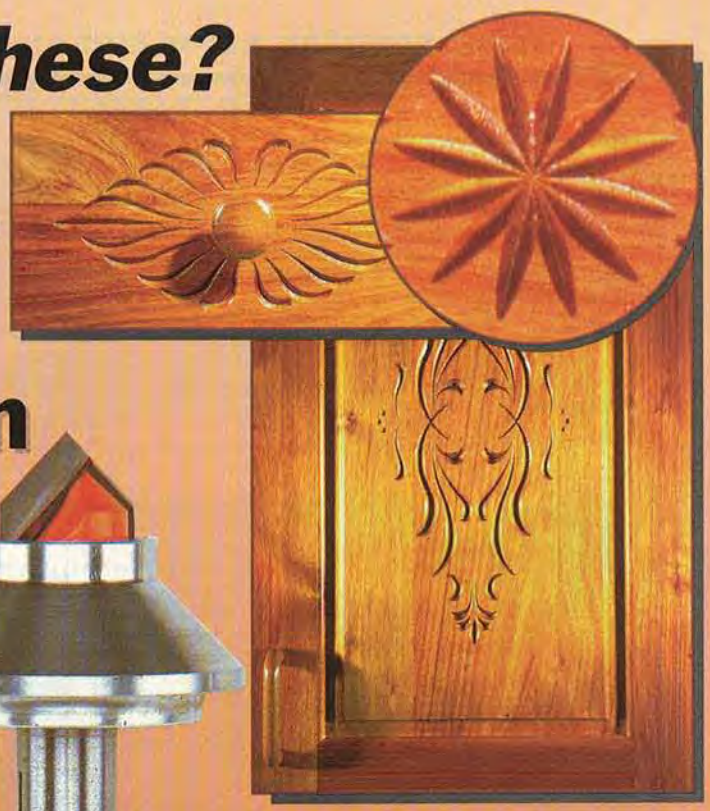

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Circle No. 43

WOOD ANECDOTE

Print this article

LIVE OAK

The tree that keeps you raking

Travelers through the Deep South marvel at the eerily beautiful live oak trees with their draping of Spanish moss. From southeastern Virginia down the coast and along the Gulf of Mexico into Texas, this easily transplanted tree has long been popular as an ornamental.

Homeowners and others charged with grounds-keeping chores soon learn how the live oak (*Quercus virginiana*) got its name. Because the tree constantly grows new leaves, it is forever green, and thus *live.* However, the new leaves replace those that fall, which means constant raking for the fastidious. And with a tree that frequently has branches extending three times as broad as its height, that's a lot of labor.

Although now seldom used for commercial purposes, the hard, strong, and heavy wood of live oak was historically quite important. When ships were made entirely of wood, live oak provided the material for the angular parts of a ship's frame called the "knees." These were sawn from the nearly 60° junction of the tree's trunk with its large roots. The natural knees thus had interlocking grain that proved much stronger than straight timber cut and joined to the same shape. The U.S. government thought the wood so valuable for the country's ships that by 1845 it had acquired about 250,000 acres of live oak timberland in the South as a future reserve. But as the days of sail and wooden ships passed, the larder of live oak land was returned to the public for eventual settlement.

Illustration: Jim Stevenson

Live oaks stay green by continually dropping their leaves and growing new ones to replace them.

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1613EVSK	1613EVS 2W/RA1051 DELUXE EDGE GUIDE	208
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3610K	14.4V CDLS DRILL KIT W/2 BATTERIES	197
3725DVS	5" DUSTLESS VS RANDOM ORBIT SANDER	143
3727DVS	6" DUSTLESS VS RANDOM ORBIT SANDER	148
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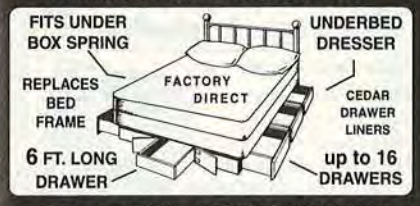

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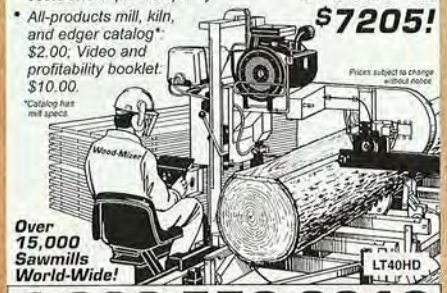

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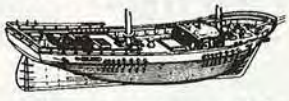

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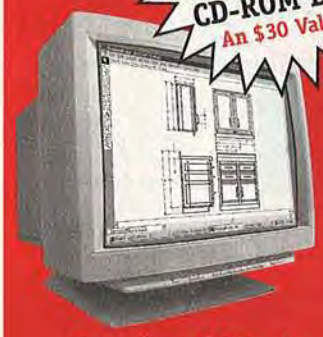

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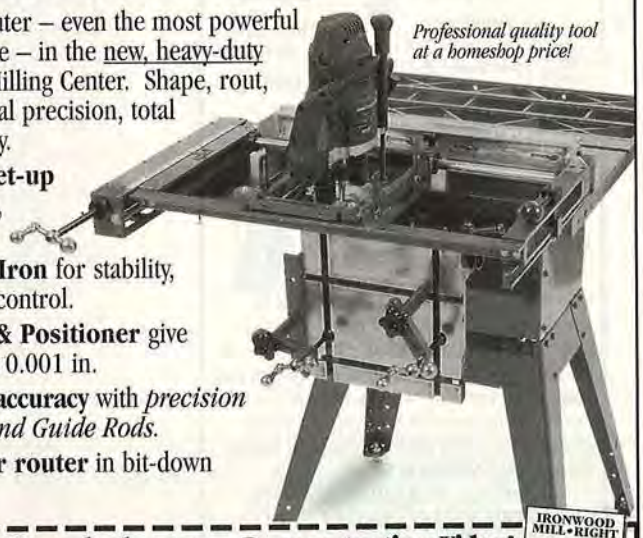

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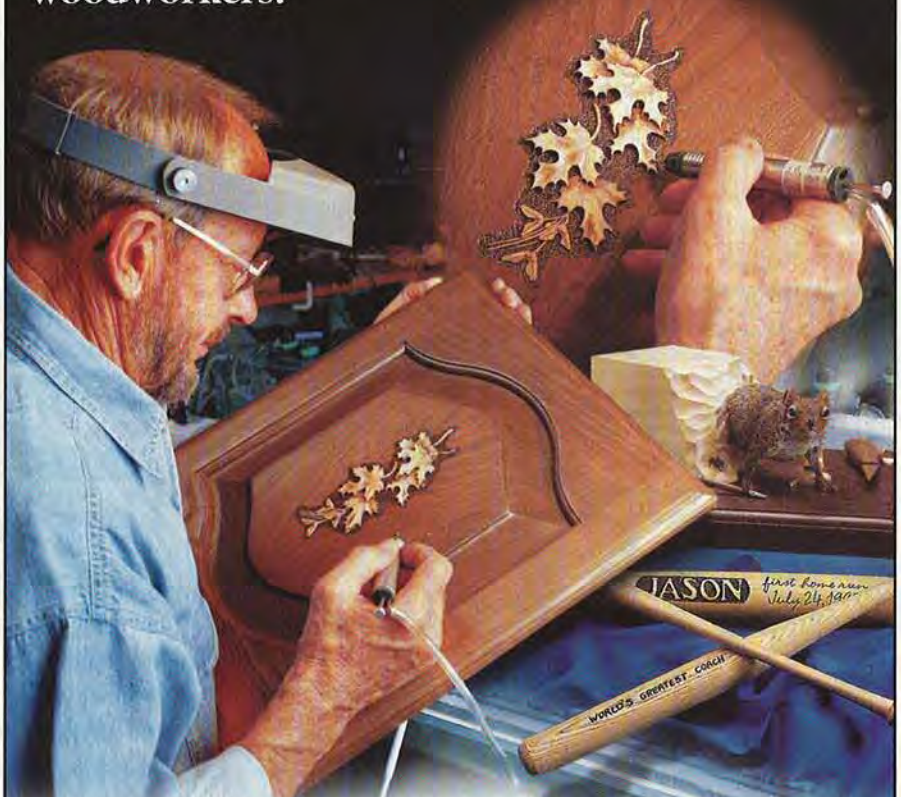

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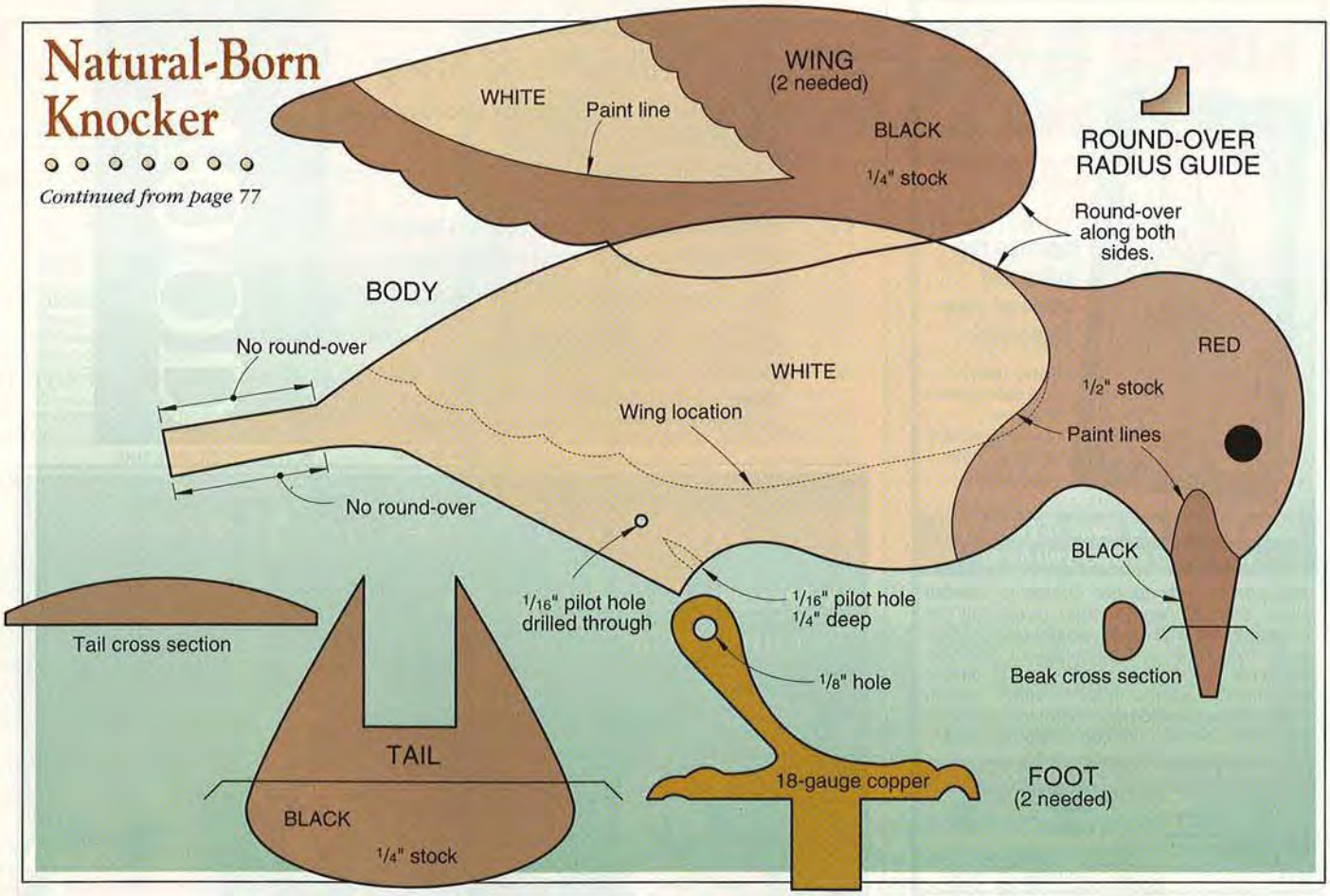
Continued from page 77



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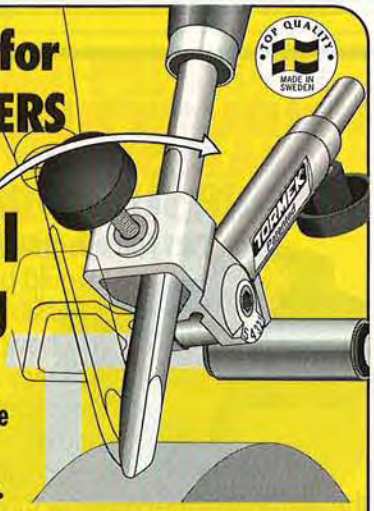

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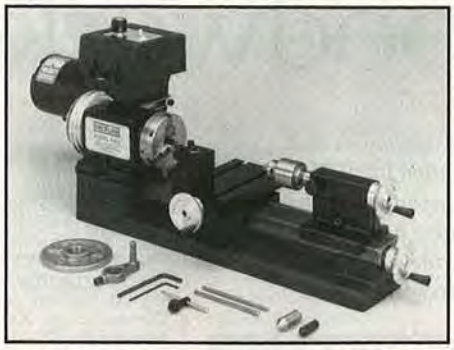

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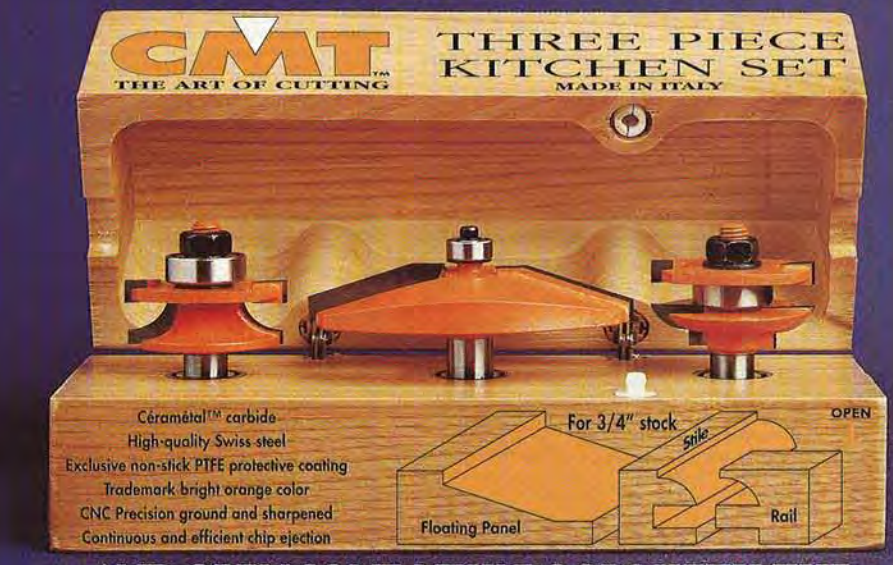

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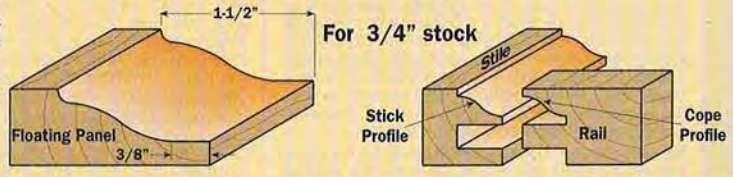

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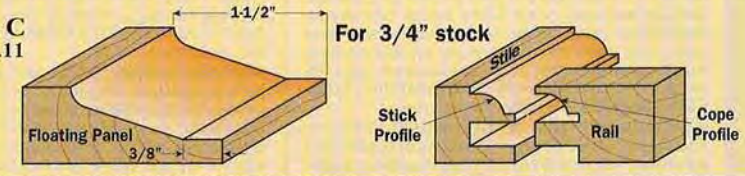

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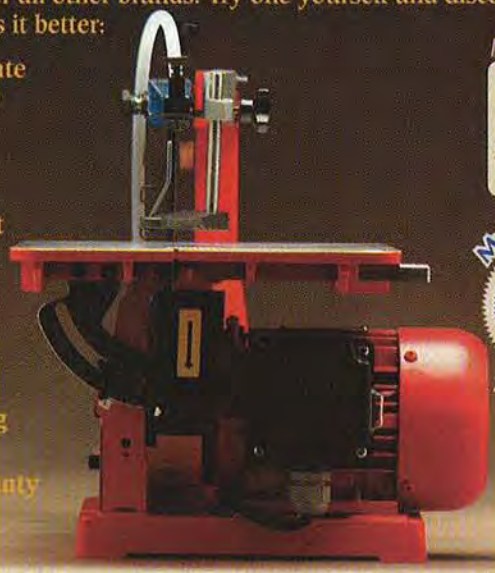

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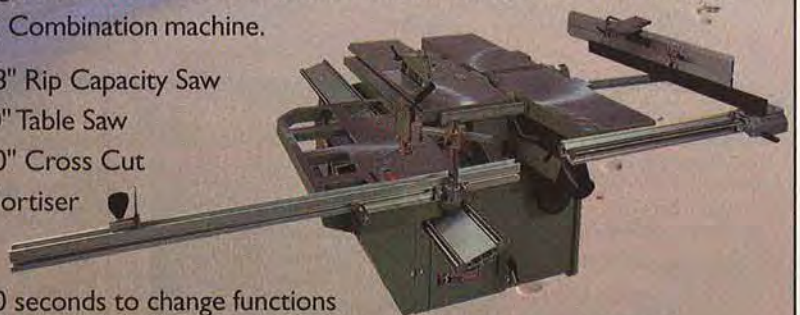

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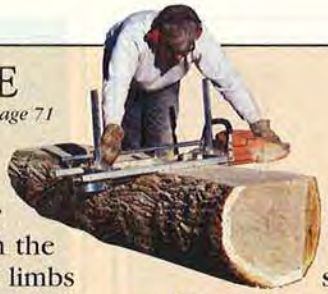
Continued from page 71



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I don't own any forested property, yet I have more logs offered to me than I can cut into boards. Here are some things that I've done to keep the logs rolling in.

•Get the word out. Once people know that you are looking for logs, you'll get all sorts of offers. Most people don't have any idea what a chainsaw mill is or how it works, so I take the time to fully explain the process to them.

•Many people feel an emotional attachment to large trees on their property, and they're often intrigued with the notion that the tree will "live on" as lumber in projects. For good public relations I sometimes offer to make for the property owner a small project from a piece of the tree.

•I don't offer to cut down a tree in exchange for the lumber if the tree is within falling distance of a home or other structure. It just isn't worth the risk. I will offer to cut the limbs into firewood if the tree is felled by a tree service. Often, a tree service charges extra to haul away a large log or cut and chop it into firewood. Recently, I saved a property owner $150 by sawing up a log left by a tree service.

•Before committing to take a log, drop by to inspect it. Don't waste your time on any log that's less than 12" in diameter, or too full of defects. If it's obvious that the tree contains nails or other metal from such things as tree forts, bird feeders, or barbed wire, then take a rain check. The metal will dull your chain, and the wood will be stained around the metal.

•If you decline to cut down a tree or take a log, explain fully and politely your reasons. That same person, or someone they know, may some day offer you the log of your lifetime.

•Inquire about housing developments or other projects in your area where trees will be cleared. When a freeway was planned to go through a wooded area, I contacted the landowner. He had sold the logging rights to a lumber company but told me I could take what the loggers left behind. The lumber company spared any tree under 24" in diameter, so I had plenty of good trees to choose from. In the time after the loggers left, and before the highway crew bulldozed the property, I milled 25 oak and walnut logs that would have gone up in smoke. I was in heaven!

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Saw-Filer's Friend

THIS OFFBEAT VISE CAME IN HANDY WHEN SHARPENING A SAW

The saw vise's throat depth lets it grip the blade just below the teeth, shown *right.* Levers, *right and below,* allow users to open and close jaws (A) and set vise angle (B) quickly.

Most of us cut wood today on a tablesaw equipped with a carbide-tipped blade. Those hard carbide teeth stay sharp for a long time. And even when they aren't perfectly sharp, the saw motor just works a bit harder to compensate.

Not so long ago, though, handsaws were the norm in woodworking shops. These saws didn't have hard carbide teeth, and they dulled quickly in hard woods. Because a dull saw translated directly into harder work for the craftsman, keeping saws keen was an ongoing concern. Many woodworkers sharpened their own to save both money and time.

Filing the teeth on a handsaw's hardened and tempered blade was relatively easy. Holding the saw while filing the teeth, though, posed a greater challenge.

That's where the odd-looking contraption shown *right* came in. The saw-sharpening vise—also variously known as a saw clamp, saw-filing vise, or saw vise—gripped the saw by the blade. With the blade held rigidly at a convenient angle, as shown *top right*, the craftsman could concentrate on filing the teeth uniformly and accurately.

The vise shown typifies those available from around the turn of the century until the 1940s. A number of makers offered a variety of models, most with easy-opening and -closing jaws about 9" long. While some were designed for permanent bench mounting, the majority featured a clamp for temporary attachment, as shown. Fancier models offered such deluxe features as rubber-lined jaws and ball-and-socket adjustment at the base.

On the vise shown, lever A opens and closes the jaws by cam action. The lever swings about 90° from fully closed to fully open. Lever B adjusts the angle of the vise to the bench. A coarsely threaded pivot bolt screws into this lever, so it, too, loosens and tightens with minimal movement. These quick-acting adjustments allow fast saw positioning.

Saw vises turn up at flea markets and garage sales, often at reasonable prices. (You may find yourself hailed as an antique-tool expert simply by identifying one of these things and knowing what it does.)

While a saw vise has curiosity value, it still comes in handy today doing just what it was intended for all those years ago—holding your handsaw while you touch up the teeth.

Vise, courtesy of F.E. Hanson, Cheyenne, Wyoming.
Photographs: John Hetherington
Written by Larry Johnston

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TOOL-INDUSTRY INSIDER

DeWalt takes the plunge into benchtop machinery

When DeWalt makes a big move in the power tool business, its competitors take notice. After all, DeWalt portable power tools didn't even exist prior to 1992. But, it has since captured 40 percent of the portable professional power tool market, according to DeWalt (its competitors peg the number slightly lower). Not surprisingly, DeWalt's new benchtop tools have the industry buzzing.

Here's what we know about DeWalt's first four models in this new line. We briefly worked with some prototype versions of these machines (like the planer *below*), but we'll reserve making any buying recommendations until we get a chance to give some production samples a thorough shakedown. So stay tuned!

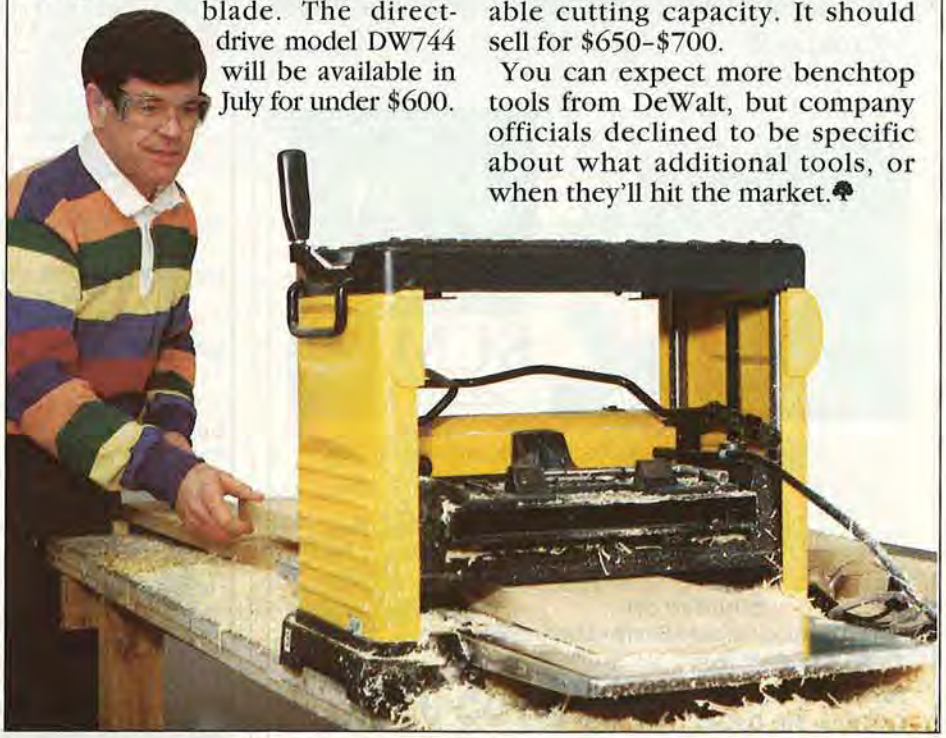
•10" tablesaw. Unlike other jobsite saws, this 64-pounder has telescoping fence rails that give it 24½" of rip capacity. And, DeWalt says a rack-and-pinion system keeps the fence parallel to the blade. The direct-drive model DW744 will be available in July for under $600.

•20" scrollsaw. This machine has arms that move via a double parallel-link mechanism similar to that found on Excalibur scrollsaws by Sommerville Design. The saw has tool-free blade changing, and up-front controls for on/off, speed (300-1750 spm), and blade tension. DeWalt officials expect the saw to sell for less than $500. Like the next two products, you should find the model DW788 on store shelves in May.

•12½" portable thickness planer. Similar to other new portable planers, this model has a head that locks on four steel posts to decrease sniping, and should sell for $450 or less. Unlike other thickness planers, the model DW733 has a rotating depth stop—much like the turret stops on plunge routers—for returning to preset thicknesses.

•12" double-bevel sliding compound mitersaw. With a 12" blade that bevels 45° left and right, and miters 50° left and 60° right, the DW708 offers considerable cutting capacity. It should sell for $650-$700.

You can expect more benchtop tools from DeWalt, but company officials declined to be specific about what additional tools, or when they'll hit the market.



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23-700	Wet/Dry Grinder	206	155
23-710	New Sharpening Center	217	169
23-680	6" Bench Grinder 1/4 HP	80	69
11-950	8" Drill Press	176	119
31-460	4" Belt/Disc Sander	198	135
40-560	16" 2 speed Scroll Saw	230	172
40-540	NEW 16" var/spd Scroll Saw	249	189
11-990	12" Bench Drill Press	255	184
11-090	32" Radial Bench Drill Press	405	335
43-505	1/2" Bench Router/Shaper	398	299
22-540	12" Bench Top Planer	Sale	369
36-220	10" Compound Mitre Saw	294	209
28-185	Bench Band Saw	213	168
37-070	NEW 6" v/spd Bench Jointer	351	265
14-650	Hollow Chisel Mortiser	380	239
33-990	10" Radial Arm Saw	981	799
33-055	8-1/4" Sawbuck comp w/legs	846	665
36-905	30" Unifence	346	245
36-906	50" Delta Unifence	444	325
36-755	10" Tilting Arbor Saw	Sale	1019
17-900	16-1/2" Floor Drill Press	490	399
37-190	6" Deluxe Jointer	603	489
36-275	8-1/4" Builders Saw	358	268
36-210	10" Compound Mitre Saw	344	225
36-040	8-1/4" Compound Mitre Saw	190	144
36-070	10" Mitre Saw	217	165
34-555	Sliding Table	487	325
34-444	10" Contractors Table Saw	Sale	659
36-250	10" Slide Compound Saw	625	489
36-230	12" Compound Mitre Saw	480	345
31-780	Oscillating Spindle Sander	253	194
46-700	12" Wood Lathe	575	465
28-275	14" Band Saw 3/4 HP	Sale	635
28-280V	14" Band Saw 1 HP motor	Sale	798
34-445	10" Table Saw w/30" fence	Sale	839
22-675	NEW DC380 15" Planer	Sale	1175
43-355	3/4" Shaper 1-1/2 HP	Sale	799
37-154	6" Jointer DJ-15	Sale	1289

MILWAUKEE TOOLS

6527	NEW Sawzall with case	343	169
6528	above Sawzall w/wired cord	339	185
6537-2	6527 w/quick lok blade change	224	175
0408-6	12V Drill w/kyls chuck&2 batt	380	172
0224-1	3/8" Drill 4.5 amp magnum	236	132
0234-1	1/2" Drill 4.5A mag 0-850 rpm	255	129
0235-1	1/2" Drill w/keyless chuck	255	129
0244-1	1/2" Drill 4.5A mag 0-600 rpm	255	129
0222-1	3/8" Drill 3.5 amp 0-1000 rpm	213	119
0228-1	3/8" Drill 3.5 amp 0-1000 rpm	207	118
0375-1	3/8" close quarter Drill	255	148
0379-1	1/2" close quarter Drill	288	165
6546-1	cdls Screwdvr 200 & 400 rpm	150	89
6547-1	6546-1 w/bits,1/4" chuck & cs	185	108
5399	1/2" D-hdle Hammer Drill Kit	356	219
6507	Original SawZall with case	278	149
5397-1	3.8" v/spd Hammer Drill Kit	275	145
5371-1	1/2" w/ spd Hammer Drill Kit	360	194
3107-1	1/2" v/spd right angle Drill Kit	411	234
3300-1	1/2" v/ spd right angle Drill	378	199
5682	Router 2 HP w/ collets	367	165
6142	4-1/2" Grinder w/cse & acc	224	125
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6256	Top Handle Jig Saw	278	159
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LU85M010	Super Cut-off	10" 80	115	59
LM72M010	Ripping	10" 24	69	38
LU73M010	Cut off	10" 60	84	45
LU87M010	Thin Kerf	10" 24	72	44
LU88M010	Thin Kerf	10" 60	88	49
LU98M010	Ultimate	10" 80	128	68
LU91M010	Compnd Mitre	10" 60	88	54
F410	Quiet Blade	10" 40	95	49
F810	Quiet Blade	10" 80	135	74
TK303	7-1/4" Finishing	40	38	25
TK906	10" Combo	50	53	32
SD308	8" Dado - Carbide		230	119
SD506	6" carbide w/case & shims		292	145
SD508	8" carbide w/case & shims		344	168
FB100	16 piece Forstner Bit Set		338	194
94-100	5 pc. Router Bit Door System		320	169
BF3	Router Table		495	289
FJ85	NEW Top Handle Jig Saw		229	125
FT2000E	3-1/4 HP variable speed Plunge Router		410	205
JS102	Biscuit Jointer w/fence & cs		355	179

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SD606	6" dial-a-width dado	369	189
SD208	8" economy dado	155	85

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766RDF-D	"Drywaller" 10 gal turbo vacuum	915	549
766RDF-DAS	Above vac w/ auto start	950	589

MAKITA TOOLS

6172DWE	3/8" v/spd Drill Kit w/ 2 batt	222	109
5090DW	3-3/8" Saw Kit 9.6 volt	280	148
DA391D	3/8 angle Drill 9.6V	166	109
DA391DW	3/8" angle Drill Kit 9.6V	341	179
ML900	Incandescent Flashlight 9.6V		19.95
6095DWE	9.6 volt Drill Kit w/2 batt	Sale	125
6095DWLE2	6095DWE w/flashlight	Sale	135
6095D	6095DW Drill only & cse	Special	65
632007-4	9.6 volt Battery	47	30
632002-4	7.2 volt Battery	39	28
6201DWHE	9.6V 3/8" Drill Kit w/2 batt	351	159
6211DWHE	12V 3/8" Drill Kit w/2 batt	368	175
6311DWHE	12V 1/2" Drill Kit w/2 batt	399	205

NEW CORDLESS DRILLS
WITH 2.0 AMP HIGH CAPACITY BATTERIES

6213DWAE	12V 3/8" Drill Kit	325	179
6233DWAE	14.4V 3/8" Drill Kit	358	199

SUPER CORDLESS SPECIALS

6073DW 7.2V cdls Drill Kit. Variable speed & clutch. Complete with battery, charger, & case. **Super Sale** 99

T220DW 9.6 volt Stapler Kit. Complete with battery, charger, & case. **Super Sale** 99

9900B	3"x21" Belt Sander w/bag	347	179
9924DB	3"x24" Belt Sander w/bag	360	189
4301BV	Orb. var. spd Jig Saw 3.5A	292	155
JR3000V	w/ spd Recip Saw w/case	264	135
9820-2	Blade Sharpener	433	215
N1900B	3-1/4" Planer with case	263	132
1912B	4-3/8" Planer	352	194
N9514B	4" Disc Grinder 4.6 amp	118	65
DA3000R	3/8" Angle Drill	355	179
2708W	8-1/4" Table Saw	637	309
6405	3/8" Drill Rev. 0-2100 rpm	115	65
6510LVR	3/8" Drill Rev. 0-1050 rpm	188	98
6013BR	1/2" Drill Rev. 6 amp	270	149
9401	4" x 24" Belt Sander w/bag	458	219
5007NBK	7-1/4" Circ Saw w/ case	250	125
5037NB	7-1/4" Circular Saw	288	155
LS1011	10" Slide Compound Saw	995	429
LS1211	12" Slide Cmpnd Saw	1620	779
3901	Plate Joiner Kit	376	199
3612C	NEW 3 HP Plunge Router	492	265
LS1040	NEW 10" Cmpnd Miter Saw	460	259

SENCO AIR NAILERS

SFN1+	Finishing Nailer 1" - 2" w/ cs	448	345
SN325	Nailer 1-7/8" - 3-1/4"	665	419
SLP20	Pinner w/cs 5/8 -1-5/8"	422	279
SKS	Stapler 5/8" - 1-1/2"	390	279
SN70	Framing -Clip Hd 2"-3-1/2"	725	449
SN60	Framing -Full Hd 2"-3-1/2"	708	459
SN65	15% more power than SN60709		465
SFN40	Finish Nailer 1-1/4 - 2-1/2	569	389

BOSTITCH AIR NAILERS

N80S-1	Stick Nailer	Super Sale	339
N80C-1	Coil Nailer	Sale	339
RN45	Coil Roof Nailer 3/4 - 1-3/4	845	369
N60FN-2K	Finishing Nailer w/ case	557	339
BT35-2	Brad Tacker 5/8" - 1-3/8"	254	155
BT35-2K	BT35-2 w/ cse, oil, & brads	279	165
CWC100	1 HP Pancake Compressor	440	289
MIIIFS	Flooring Stapler 15 gauge	902	529
S32SX-1	Finish Stapler-1/2" - 1-3/8"	245	155
S32SX-1K	S32SX-1 with case & oil	269	165

SKIL TOOLS

77	7-1/4" Worm Drive Saw	Sale	158
77M	77 Mag Worm Saw	Sale	168

PANASONIC CORDLESS

EY6181CRKW	9.6V Drill Kit w/ 2 batteries, 1 hour charger, & case	307	169
EY6100EQKW	12V Drill kit w/ 2 Ironman batteries, 15 min. charger, & case	379	194
EY6100SEQK	Same as above but has 1 Ironman battery and 1 diagnostic battery	Sale	204
EY6101SQK	12 volt 1/2" Drill w/ 15 min. charger, diagnostic battery, & case	438	249
EY6101EQKW	Same as above but has two Ironman batteries	Sale	249
EY3502EQKW	NEW 4-3/8" 12V Metal Cutting Saw Kit	500	289

PASLODE IMPULSE GUNS

IM250	Trimpulse Finish Nailer Kit	1130	548
IM325	Impulse Framing Nailer Kit	1130	548
CT325SS	Cdls Framing Nailer Kit	1120	495

CLAYTON OSCILLATING SPINDLE SANDERS

140	Portable sndr w/ 4-1/2" spindle	625	559
146	Portable sander w/ 9" spindle	685	609
100	Floor mount sndr 4-1/2" spindle	785	709
106	Floor mount sander 9" spindle	845	759

SIOUX TOOLS

8030	3/8" var/spd Drill	263	149
8000	3/8" var/spd close qtr Drill	211	125
690	5" Air Random Orbit Sander	228	132

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DW995K
1/2" Drill Kit
Sale 229

DW997K
1/2" Drill/Hammer Drill Kit
Sale 249

DW936K
Saw Kit
Sale 249

DW995KS-2
DW995K Drill, DW936 Saw and case
Sale 395

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AMERICA'S LOWEST PRICED TOOLS
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PRICES SUBJECT TO CHANGE WITHOUT NOTICE

DEWALT TOOLS

Model	Description	List	Sale
DW321K	NEW Jigsaw Kit	300	164
	DW321K comes w/ Free 8 piece blade set		
DW364	7-1/4" Circ. Saw w/brake	294	162
DW610	1-1/2 HP 2 handle Router	266	152
DW411	1/4 sheet Palm Sander	88	58
DW100	3/8" Drill, 4 amp,0-2500 rpm	118	68
DW682K	Biscuit Joiner with case	448	199
DW705	12" Compound Mitre Saw	734	359
DW705K	DW705 with 80 tooth blade	Sale	395
DW625	3 HP v/ spd Plunge Router	Sale	279
	DW625 router comes with DW6965 fine depth adjuster and 8-piece template guide set		
DW621	NEW 2 HP Plunge Router	400	218
	DW621 comes with Free DW6956 fine height adjuster		
DW675K	3-1/8" Planer with case	292	164
DW431	3 x 21 v/spd Belt Sander	338	188
DW421	5" Palm Ran. Orb Sander	144	74
DW444	6" Ran Orb Sander	266	145
DW443	DW444 w/hook & loop pad	266	145
DW673K	NEW Laminate Trimmer Kit	364	186
DW935K	14.4V 5-3/8" Trim Saw Kit with 2 batteries	444	237

DEWALT CORDLESS DRILLS

DW952K	3/8" variable speed w/ two 9.6V XR batteries	284	139
DW962K-2	3/8" variable speed w/ two 9.6V XR batteries	330	179
DW972K-2	3/8" variable speed w/ two 12V XR batteries	362	162
DW904	12 volt flashlight	48	29.95
DW972K-2 drill & DW904 flashlight		*Sale*	*205*
DW991K-2	3/8" variable speed w/ two 14.4V XR batteries	415	209
DW994KQ	1/2" variable speed w/ one 14.4V XR batteries	458	235
DW994KQ-2	above drill w/ 2 batt	Sale	259
DW996K-2	1/2" v/spdw/ two 14.4 XR batt	Sale	259
	Above drill kits come w/ charger & steel case!		
DW991KS-2	DW991K drill, DW935 trim saw, & case	Sale	349

HITACHI TOOLS

C8FB2	8-1/2" Slide Compound Saw	1169	489
C10FC	10" Mitre Saw	533	199
C10FS	10" Slide Compound Saw	1627	739
C15FB	15" Mitre Saw	1346	659
NR83A	Framing Nailer 2 - 3-1/2 Full Head	900	389
NR83AA	Framing Nailer 2 - 3-1/2	922	369
NV45AB	Coil Roofing Nailer 7/8 - 1-3/4	935	399
EC6B	1 HP Oil Compressor	540	279
EC6C	1 HP Oil-less Compressor	580	295
C7SB	7-1/4" Circular Saw	Sale	105
FDS10DVA	9.6V Drill Kit w/ flashlight	Sale	99

BIESEMEYER FENCES

B-50	50" Commer, Saw	443	325
T-SQUARE 52	52" Homeshop	360	269
T-SQUARE 40	40" Homeshop	335	249
T-SQUARE 28	28" Homeshop	325	239

PONY CLAMP FIXTURES

Model	Description	List	Sale	Lots of 12
50	3/4" Black Pipe	15.45	8.10	92.50
52	1/2" Black Pipe	12.65	6.95	74.95

BOSCH

Model	Description	List	Sale
1567VS	Top Handle "CLIC" Jig Saw	292	139
1587VSC	1587VS saw with case	Sale	149
1584VS	Barrel "CLIC" Jig Saw	288	139
Bosch Metal Case for above Jig Saws			24
Bosch 30 blade assortment for Jig Saws			28.99
	1584VS or 1587VS with steel case and 30 Bosch blades	Sale	175
3270DVS	3"x21" v/spd Belt Sander	301	165
1276D	4"x24" Belt Sander	379	225
1275DVS	3"x24" v/s Belt Sndr	379	219
1276DVS	4"x24" v/s Belt Sndr	408	219
1347AK	4-1/2" Grinder w/cs & acc	172	105
1194VSR	1/2" w/ spd Hammer Drill	272	155
1194VSRK	above Drill w/ case	303	169
1604A	1-3/4 HP 2 Handle Router	269	142
1604AK	same as above w/cse & acc	337	185
1613EVS	2HP v/s Plunge Router	369	199
1615EVS	3 HP v/s Plunge Router	536	289
1634VSK	Recip Saw 10.5 amp	335	159
3310K	12V T-handle Drill Kit	345	175
3610K	14.4V Drill Kit	354	195
3107DVS	5" Random Orbit Sander	165	98
3107DVSK	3107DVS with case	195	115
3725DVS	5" Random Orbit Sander	256	149
3727DVS	6" Random Orbit Sander	266	154
B3915	10" Slide Compund Saw	1050	589
B7000	Corner Detail Sander	126	68
B7001	B7000 w/ variable speed	Sale	89.95
B4050	In Line Jig Saw	206	119
11224VSR	7/8" SDS Rotary Drill	404	229

STABILA LEVELS

24740	24" Angle Setter Level	Sale	14.95
24640	24" Level w/ hand holes	62.20	43
24670	48" Level w/ hand holes	79.70	55
24680	72" Level w/ hand holes	145.45	99
27170	48" Level w/o hand holes	71	49
27000	78" Level w/o hand holes	146	105
60LMS	NEW Laser Level System	532	365

AIRY AIR NAILERS

Model	Description	List	Sale
0241SK	Brad Nailer 3/8"-1 9/16"	180	96
0250SK	Brad Nailer 3/4"-2"	296	164
0626SK	1/4" Crown Stapler 3/8"-1"	194	104
0645	1/4" Crown Stapler 3/4"-1-9/16"	310	175
	Above Nailers come w/case, fasteners, oil & wrenches		
0565T	Angle Finish Nailer 1"-2-1/2"	386	205

RECORD WOODWORKING VISES

Model	Jaw\Width	Opening	List	Sale
53E	10-1/2"\115"	Quick release	248	109
52D	7"\8"	Quick release with dog	169	85
52-1/2D	9"\13"	Quick release with dog	231	95

PORTA NAILER

401	Porta Nailer complete	295	209
501	Face Nailer complete	295	209

DAVID WHITE

LP6-20	Sight Level package - 20x	329	215
LP6-20XL	LP6-20 w/9056 Tripod & 7620 rod	269	
LT8-300	Level Transit - 26x	739	489
LT8-300P	above Level w/ optical plum	869	565
LT6-900	Level Transit - 20x	419	269
ALT6-900A	Auto Level - Transit -18x	666	429
ALTP6-900	above Level with tripod & rod	799	499
ALP6-18HD	above Level w/ tripod & rod	599	395
LL100	Finish Line Laser Level	199	135
ML200	NEW Visible Beam Laser	979	799
ML200I	ML200 w/o detector & rod bracket	749	625

RYOBI SPECIALS

RE600	3 HP Plunge Router	500	235
BE321	3"x21" v/ spd Belt Sander	310	139
BT3000	10" Table Saw w/ stand	1125	539
AP12	12" Bench Planer	684	389
OSS450	Oscillating Spindle Sander	340	159
HT20VSK	NEW Multi Tool	115	55
CD125K	12V cordless Drill w/ 2 batt	175	109
CTH1442K	14.4V 3/8" Drill Kit	275	159
WDS1600	16"x32" Drum Sander	980	569
DBJ50	NEW Detail Biscuit Jointer	114	69

Msxe6362	FEIN Triangle Sander v/spd	199	
Msx625	FEIN New Air Triangle Sander	195	
LPN672	PONY Air Palm Nailer w/glove	89	
RTM01	ROTOZIP Drywall cut out unit	66.95	

QUAL-CRAFT PRODUCTS

2200	Pump Jack	79	58
2201	Pump Jack Brace	30	20
2203	Pump Jack guard rail holder	31	21
2204	Workbench & rail holder combo	53	39
2500	Adjustable Roofing Bracket	9.95	7.95
	Buy any 6 (can be assort.) deduct 10%		
2601	Wall Jack	167	108
	Lots of 4 deduct additional 10%		

PORTER CABLE

9444	New Profile Sander Kit	220	119
7499	Ultimate Cut-out tool	119	69
97499	7499 w/ case & bits	150	89
690	1-1/2 HP Router 8 amp	278	149
90690	690 Router w/ steel case	309	159
691	1-1/2 HP Router D-handle	303	164
693	1-1/2 HP Plunge Router Base	338	184
6931	Plunge Router Base	139	82
695	1-1/2 HP Router/Shaper	418	235
696	Heavy Duty Shaper Table	238	135
352VS	3x21v/s Belt Sander w/bag	321	165
360	3"x24" Belt Sander w/ bag	397	214
360VS	360 Sander w/ variable speed	429	229
362	4"x24" Belt Sander w/ bag	412	224
362VS	362 Sander w/ variable speed	446	239
97751	1/2" v/spd Hammer Drill w/cse	274	155
9125	NEW 3-1/4" Planer Kit w/ case	250	145
9118	Porta Plane Kit 7 amp	400	229
505	1/2 sheet Pad Sander	249	139
97549	Top handle Jig Saw 4.8 amp w/ case & blades	275	144
330	Speed Block Sander 1/4 sheet	120	65
556	Biscuit joiner w/5556 fence	Sale	139
345	6" Saw Boss 9 amp	207	118
9345	345 comp. w/cse & carb blde	237	138
9647	TIGER CUB Recip. Saw	230	134
9637	Full var/spd Recip Saw 8 amp	276	148
7519	3-1/4 HP Router 2 Handle	469	255
7518	3-1/4 HP 5 speed Router	534	284
7539	3-1/4HP v/spd Plunge Router	534	279
7310	5.6 amp Laminate Trimmer	176	102
97310	Laminate Trimmer Kit comp	336	189
7335	5" Random Orbit Sander	254	135
97355	7335 w/ case & dust pick-up	274	145
7336	6" Random Orbit Sander	259	138
97366	7336 w/ case & dust pick-up	284	149
73333	Dust Collection system	24.50	
332	Palm Grip Rndm Orb Sander	133	68
333	above sander with dust bag	148	68
334	333 Sander with PSA pad	148	68
550	Pocket Cutter with case	352	195
310	Production Lam. Trimmer	270	154
347K	7-1/4" "Framers" Circ Saw with plastic case	250	129
743K	7-1/4" "Framers" Circ Saw with case - left hand version	250	129
447	347 Saw w/ brake & case	259	139
7800	Drywall Sander	589	335
9737	Tiger Recipro Saw	307	165
BN125	Brad Nailer -18 ga. 5/8" - 1-1/4"	144	89
BN200	Brad Nailer -18 ga. 3/4"-2"	238	139
FN250	Finish Nailer -16 ga. 1"-2-1/2"	362	215
DA250	Angle Nailer -15 ga. 1-1/4"-1-1/2"	412	229
FC350	Framing Nailer - clipped head	558	319
FR350	Framing Nailer - round head	558	319
9830	NEW 9.6V Drill Kit w/ 2 batt	284	139
9862	NEW 12V Drill Kit w/ 2 batt	382	179
9872	NEW 14.4V Drill Kit w/ 2 batt	424	205

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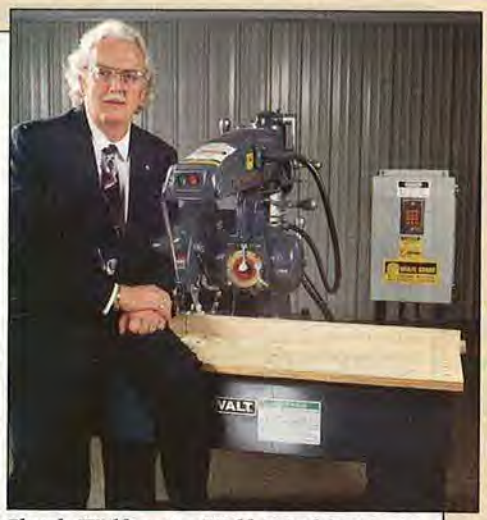
Still sawing, and sawing, and sawing

Referred to by many commercial woodworkers as the Cadillac of radial-arm saws, the DeWalt line was discontinued by Black & Decker in the 1980s. The Lancaster Machinery Company of Pennsylvania next built the saws under the Original Radial Arm name until 1990. Then, the company was sold to a Britt, Iowa, firm that still makes new ones.

But Wolfe Machinery, of Johnston, Iowa, believes in the first version of the DeWalt radial-arm. So it now offers completely refurbished and warranted models, service, new replacement parts, and safety upgrades to meet OSHA, ANSI, and insurance standards. According to Chuck Wolfe, head of the company, the timeworn DeWalt saws are carefully restored to original factory standards and should last 30–40 more years. The 8–46" saws (the largest are called "timber cutters") sell for up to 50 percent less than comparable new saws. For details, call 800/345-6659 (fax 515/270-0628) or write Wolfe Machinery Co., P.O. Box 497, Johnston, IA 50131–0497.

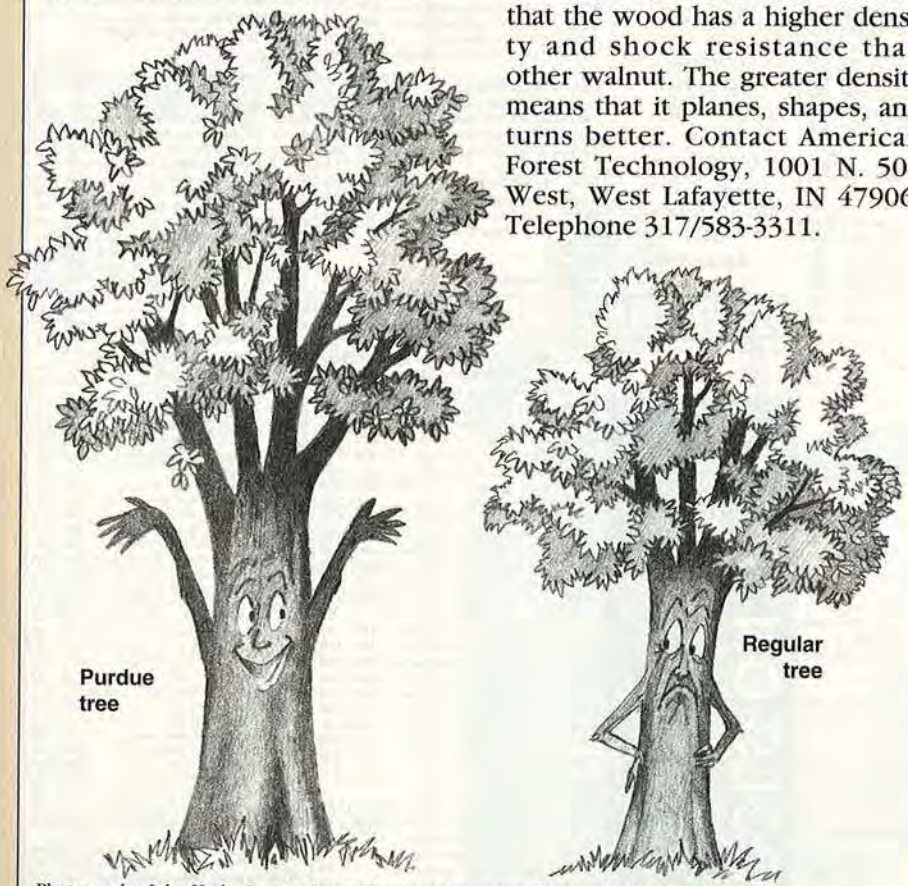


Chuck Wolfe runs Wolfe Machinery, an Iowa company that puts new life into vintage DeWalt radial-arm saws by completely refurbishing them. The line was discontinued in the 1980s.

Better black walnut, and quicker, too

Thanks in part to over three decades of research at Purdue University, tree farmers can now plant walnut trees that mature in 25 to 35 years. The genetically superior trees grow 18.5 percent faster than their parent trees, which were earlier strains developed and patented by the university, says Norman O'Bryan, president of the Indiana firm that developed and markets the "super" trees.

Not only does the new walnut variety produce more veneer-grade wood faster, tests at the USDA Forest Products Laboratory in Madison, Wisconsin, indicate that the wood has a higher density and shock resistance than other walnut. The greater density means that it planes, shapes, and turns better. Contact American Forest Technology, 1001 N. 500 West, West Lafayette, IN 47906. Telephone 317/583-3311.



Photographs: John Hetherington; James Elliott Illustration: Jim Stevenson

Lunker lures

Sparked by the article "In search of Moby Dick" on this page in the September 1995 issue, reader James Elliott of Ellwood City, Pennsylvania, sent in the photo *below*. It's Ed Latiano, a friend of Jim's, with some giant-sized replica fishing lures that he made from old cedar telephone poles.

Ed, 86, has been making functional wooden fishing lures for over 50 years. He turns them on a lathe, then paints them with an airbrush. He sells large ones, such as those shown, to collectors and tackle shops for display.

Below: **Hanging from the railing in front of Ed Latiano are replicas of famous lures from the past. From left: Heddon Vamp, Shakespeare Slim Jim, Heddon Strawberry Vamp, Creekchub Pikie, and Ready Eddy Jerkbait.**

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and the experts agree, IT IS!

The independent bimonthly magazine, **Shop Notes**, tested the **JET**, Delta, Sears, Grizzly, Powermatic, and AMT 10" tablesaws.

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